THE STEWART ISSUE

THE BIOLOGIST

A Quarterly Journal Promoting Research
Interest in the Biological Sciences

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2. Conducts Initiations and Installations as Custodian of the Ritual.

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NOTICE

to

Phi Sigma

ALUMNI

regarding

SUBSCRIPTIONS

to the

"Biologist"

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Box 454, Blacksburg, Va.

The
HONORARY PRESIDENT
of
Phi Sigma

Dr. Laurence H. Snyder

Geneticist, Author, Teacher

THE BIOLOGIST

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BIOLOGISTS ARE PEOPLE*

By Laurence H. Snyder

The University of Oklahoma

Let me first of all thank you sincerely for permitting me to hold the honorary presidency of this society. I appreciate the position tremendously, and I am very glad to have the opportunity to speak on this occasion to a representative group of the coming generation of biologists.

Your membership in Phi Sigma signifies several things. First, of course, you have expressed an interest in some branch of biology as a life work. Second, you have shown considerable promise in this field. And third, the fact that you are already members of the society indicates that you have completed or are about to complete at least the undergraduate part of your academic preparation. It is thus appropriate and feasible for me to discuss with you some of the implications of the careers upon which most of you are about to embark.

Two things, I suspect, will be uppermost in your minds as you start out on your life's work: success and security. It is a troubled world in which we live: an uncertain world into which you now step in search of these two essentials. What are your chances of finding them in the world of today? It will not be as easy as it once was. It will take more serious thinking and more definite action on the part of each of you to achieve either security or success today than in the calmer times of more tranquil periods of our history.

And it is no longer merely personal success and security towards which you must strive. Important as these are, it is today equally important to bend every effort towards the collective success, security, peace and happiness of all our citizens, and indeed of all peoples everywhere. No longer can the interests of a man or woman be confined to his or her job and family. We are all, willy nilly, citizens of the world, with individual and collective obligations far beyond anything we dreamed of a few short years ago. And no single one of us dares ignore these obligations.

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*Presidential address delivered at Gainesville, Florida, September 6, 1954, to the Convention of Phi Sigma.

In recent years I have had the opportunity of traveling over much of the globe on speaking trips. It has been a sad experience to see the world gradually becoming divided. As a young man I was accustomed to see scientists from any country anywhere at various international meetings. Gradually certain groups began to make objections to specific resolutions, or to particular topics suggested for symposia. Then definite attempts were made by blocs of delegates to interfere with the orderly conduct of international meetings, and finally the schism was complete. So-called international meetings today are not truly international at all. This is shameful, as there are scientists in every country who have things to offer to the world of science, if only free and honest discussion could prevail.

Not too long ago Mrs. Snyder and I sat at the speakers' table in London's largest banquet hall, before the delegates to the world's oldest international medical congress. With us at the table was the American Ambassador. In his after-dinner speech to the delegates, he found himself unable to stay on the lighter side, and was constrained to speak seriously of the dangers confronting all of us. It was heartening to witness the unanimity with which his remarks were received and approved, although, of course, certain nations had refused to participate. Nevertheless, the 1200 delegates, representing 64 nations from many parts of the globe, heard his official promise that the prime motive of the United States is to establish security for all peoples of the world.

Although within the banquet hall everything appeared luxurious and splendid, we were all aware of the fact that, in order to reach it, we had driven through miles of destruction left over from the last war. Great gaps appeared in the London landscape. Bomb damage was evident on all sides. In such a situation it is difficult not to become philosophical. It is difficult not to speculate. Who won the last war? Who now can claim to have gained victory? The answer is, of course, that everyone lost. Everyone now suffers in one way or another from the ravages of war.

The bomb destruction which we saw both in England and on the continent, terrible as it was, represented but a drop in the bucket to potential destruction in the future. A building here, a group of buildings there, but little city-wide ruin, mark the older bombing raids. But the potential destruction of the future involves entire lands, a city at a time. Many of you here today are veterans, and you know these things. You learned them the hard way. We must find some way for people to learn them without the awful demonstrations of war, and to make them forever unnecessary.

Of equal importance with the dangers from abroad are the dangers right at home. Those envisaging scientific careers may well pause and ponder when they hear able and loyal scientists publicly denounced on the "guilt-by-association" theory. It is to be hoped that the intellectual climate of America will once again become bright and clear.

What can we as individuals do about security? Some of you may find yourselves actively engaged in establishing it through military procedures. Others may participate in governmental or diplomatic endeavors. But the success of democracy is not wholly or even largely a military or governmental problem. Democracy is not an idea centered in or controlled from Washington. It is a way of life of a people. This country will never be able to do the essential job of selling democracy abroad unless it is truly democratic at home. For us, democracy must be centered in our own communities, in our universities, in our homes and in our daily lives. The principles of democracy and of the Golden Rule must be vivid everyday experiences to each of us. There is so much that each of us can exemplify day by day to aid in collective security, and hence inevitably in personal security.

The fine responses of many of the states to the recent pronouncements regarding the ending of academic segregation are great steps forward in advancing the cause of democracy. There are many steps of many kinds, involving kindness, tolerance, understanding and unselfishness, that each of us can take every day to strengthen democracy at home, and thus to increase the hope of a decent, peaceful world in which to live and work and raise our families.

One of the very important things that each of you can do along these lines is to be informed and alert regarding any tendency towards a rise in the wave of anti-intellectualism which threatens to sweep the country. This means that you must have at your disposal a breadth of training on which to draw in meeting the obligations of good citizenship. Your fellow citizens in years to come are more likely to judge and evaluate you by your general education, which they can appreciate, than by your technical knowledge, of which they will often have no adequate measure. It is of the utmost importance that you have an abiding interest in and appreciation of the cultural implications of your profession. Only in this way can you formulate for yourselves an adequate philosophy of life, and only in this way can you be informed, and thus alert.

Science can no longer afford to be compartmentalized and isolated. Problems which might once have appeared to be the sole interest of the specialist have become cosmopolitan in their far-reaching effects. The biologist is first of all a human being, a member of society, and world society at that. No problem is devoid of social implications, and none can be completely solved these days without drawing upon the subject matter of many disciplines.

This is frankly a plea for a more general education. The artificial barriers which once compartmentalized the various branches of knowledge are rapidly breaking down, and only those who refuse to see are continuing to inform themselves solely along narrow specializations. Such words as biochemistry, social psychology, paleogeography and bioeconomics signify a trend which must not be ignored. You can not predict today whether the answer to some future question of importance to your biological research will have its roots in ethnology, or sociology, or economics, or history, or the fine arts. Of course you can not learn all the available facts in all fields, but you can have at least an acquaintance with a broad selection of the humanities and the arts, and you can have some understanding of how to tap such knowledge.

You can not eat so much at one time that you will never be hungry again. But you can take in what you are able to assimilate at the time, in a number of areas; and you can learn to know where to look for and how to obtain the nourishment you will need in the future. And the nourishment, to be effective, must be of diverse kinds. For, in the same way that your biological needs demands a variety of nutritional foods for physical well-being, your social requirements call for a varied intellectual diet for the fulfillment of healthy world citizenship. A varied intellectual diet can not consist solely or even largely of science courses which at the moment seem directly related to your vocation. It must include the vitamins of the humanities, the minerals of the arts and the salts of the social sciences.

It is essential to keep in mind the fact that both science itself, and the social millieu in which it develops and functions, change rapidly. Many of the technics you will use in the future have not yet been invented; many of the concepts of tomorrow's science have not yet been formulated; many of the principles you will employ are as yet undiscovered. Nevertheless you must be mentally prepared to use them when they are invented, formulated or discovered, and in fact to do your part in inventing, formulating and discovering them.

If I were to ask you today whether you think the automobile is here to stay, you would probably say, "Are you serious? Of course it is." Yet I tell you that it is not. Soon it will be completely outmoded and will have disappeared from the scene. As a boy, I rode in a horse car. Then came the wonderful trolley car, a marvelous invention to solve the transportation of cities. Where is the trolley car today? Where is the steam locomotive?

There is no security in present-day things, or in the concepts of the moment. Security must come, in the last analysis, from within yourselves, from your own mental attributes and attitudes. With an inquiring mind, tolerant, open to suggestion and criticism, armed with a modicum of understanding of other disciplines, other languages and other cultures, aware of the major social problems of mankind and of the attempts that have been made at their solution, together with a willingness on your part to perform the duties of citizenship; with the ability to use your native language clearly and precisely; and with a high degree of attainment in some scholarly branch of knowledge, you will have done all you can towards the attainment of such security as is possible in the world of today.

So much for security. What of success in life? Success, like security, is no longer wholly an individual endeavor. It depends in important ways on your facility in interlocking your own individual capacities with those of others. Success, if it comes to you, will be a reflection partly of your innate abilities, and partly of your acquired skills both in subject matter and in cooperative social behavior.

In the long run, what you become and how you go about it will depend on the complex interplay of two things, your heredity and your environment. These are not separate and independent, as some people think. They are in constant interaction, and can not easily be disentangled in our daily lives. Sometimes you hear the question asked, which is more important, heredity or environment? You might as well ask which is more important to a railroad, the train or the tracks; or, which is more important to an air line, the planes or the air they fly in.

But merely acknowledging the existence of heredity and environment as variable influences in your lives is not enough. You must realize that both must be exploited by you to the full. You must do your utmost to obtain the most benefit from each. And it cannot be done by sitting idly by. To obtain the most from either our heredity or our environment requires active effort.

It is easy to say, "Oh well, I can't do anything about my heredity now." It is true that you cannot change the actual hereditary factors you received: the chromosomes and the genes in your cells. But many traits which have a hereditary basis have many different degrees of expression which they may reach, depending on the conscious effort of the individual. Our characteristics range all the way from those in which heredity plays almost the exclusive role to those in which environment plays almost the exclusive role. These extremes, however, are not common. Most of the important characteristics that we are interested in are about equally affected by heredity and environment.

To show you what I mean, let us think of some human traits and what brings them about. For example, the color of your eyes is not determined in the least by the place you happened to be born, or who your companions and playmates were. It is determined exclusively by the hereditary factors which you received from your parents. So also is your blood group and the fact that you are within the range of normal intelligence rather than being feeble minded, and many, many other characteristics. This is not to say that such traits cannot be influenced by the environment, but only that our normal range of environment has no power to change them.

The language you speak, however, and the accent with which you speak it, are very largely determined by the place you were born and by your early companions, and are for most of you but little influenced by variations in your heredity. This is not to say that hereditary factors are not involved. You all inherited normal speech apparatus and normal hearing, both of which are necessary to normal speaking. Consider how different your accent would be, for example, if you were born with hereditary harelip or cleft palate; or with hereditary deafness, or with a hereditary defect of the vocal cords. Under those conditions your accent would not be what it now is.

But these are extreme cases where variations in either heredity or environment provide the major differences among individuals. For most traits there are variations in both which must be taken into account in building your lives. Consider, for example, your intelligent behavior. The limits to which your innate intelligence can reach are probably set by heredity, but how well you attain these limits and how significantly you develop your intelligence and use it are largely under your own control. Your home training, your companions, your teachers, your nutrition, health and hygiene, and your day by day application, all play large parts in determining the ultimate character which we call intelligent social behavior.

It is not very good sense, therefore, to blame your limitations on your heredity. It is far better sense to ask yourself: "Am I doing all that I possibly can with the abilities with which I was born?"

Human evolution has resulted in an ever increasing measure of man's control over the environment, a control which has been made possible by the development of the human brain. This development, however, has another implication of importance to our present discussion. The vertebrate brain consists, among other parts, of the cerebrum, and the diencephalon, lying between the cerebrum and the cerebellum. As man has emerged from the evolutionary process, the diencephalon has remained much the same as in his vertebrate ancestors, but the cerebrum has not. The exceptional development of the cerebral cortex in man is unique. Researches on the function of the diencephalon, and especially of that part known as the hypothalamus, indicate that in this portion are contained the mechanisms for the control of certain primitive visceral and somatic reactions associated with emotional states. The cerebral cortex, on the other hand, comprises areas involved in thought, memory, communication, abstraction and symbolizing.

Thus, although through the hypothalamus you share such emotions as anger and terror with lower animals, intelligence, judgment, foresight and analytical ability are almost uniquely yours. It is your privilege as human beings to make the most use of these hereditary potentialities and to choose for yourselves the best possible environment in which to develop your own peculiar combinations of abilities.

It is your privilege to take full advantage of educational opportunities and so to use them as to truly enrich your lives. And when I say educational opportunities, I am not referring entirely to schools and colleges. Schools have been set up so as to provide an efficient and reasonably standardized route for fundamental education, and to make sure that everyone actually does get, as far as he is capable of receiving it, at least the basic education necessary for life in a democracy. But schools and colleges are only one way of receiving an education.

You have completed the basic requirements of a collegiate course. What shall you do now? Well, first of all, it would be well to think a little about the path you have already traveled, and to evaluate for yourselves something of what it has meant to you this far. Only in this way can you plan the future with any assurance.

If, for example, as a result of your college studies you have at your disposal merely a mass of information and skills, a system of terminology, a memorized list of the "rules of the game," and a thousand and one symbols and laws, with no fundamental understanding of or interest in how they were derived, then you may find further formal education only a bore. Practical, on-the-job experience will be your wisest choice, and may well lead you to the permanent type of work you will enjoy. If, on the other hand, as a result of your college venture, you have found yourself looking beyond the local and temporary incidents of experience, and have seen there unexplored intellectual vistas which call to you, unobscured by prejudice, preconceived notions, or blind belief in the printed word, then you may find in graduate training the answer to your dreams and aspirations.

If you should go on into further college work, you will find, as you undoubtedly have found thus far, rules and regulations which make it necessary for you to do a certain amount of studying and learning in order to continue your training. But there is no law against studying and learning for those who are not in school. Books are always available, as are lectures and concerts, and the wisdom and advice of those who are already proficient in the things you wish to learn more about.

May I express the hope that you will continue to hold in high esteem two fundamental concepts which unfortunately seem to be slowly losing the interest of younger men and women. The first is that research can be of value for its own sake as well as for any practical applications it may ultimately have. The other is that research is a privilege, and to a very large extent is its own reward. Love of it must come from the heart. It pays its biggest dividends in the form of personal satisfaction: in the feeling of having a part in the age-long and never-ending struggle to add to the sum-total of the world's knowledge.

In my daily work I see disquieting evidence that these concepts, which I hold very dear, are beginning to crumble. As a graduate dean, I am constantly aware of research projects which are started only because they may lead to a useful gadget, or process or treatment. But practical applications are seldom developed except on the basis of fundamental research, and the really exhilarating pioneering is done in the areas of basic research, with no thought of immediate applications. With the lure of available geographical frontiers for exploration largely gone, the challenging frontiers today are the boundaries between known and unknown concepts, hypotheses, laws and principles.

In my capacity as a member of various boards and panels having to do with the allocation of research funds, I find another disquieting trend. Too many young men today demand a monetary return for every bit of research to be attempted. To me a "quid pro quo" for research is an indication of an unhealthy attitude. I do not mean that researchers should starve to death, and I am sure that they do not, but I do mean that when the joy of doing research for its own sake is gone, much of the creative spark that kindles truly basic research is also extinguished. Let me urge you at least to start your researches on your own, without worrying about hourly pay rates. In most biological positions, time for research is available if you really want to do it. Get started on your own, and the rewards will follow.

One of my agricultural colleagues was recently sent to Pakistan, to participate in the work of the Point Four program. While there he naturally wanted to see all he could of the country and its institutions. Among other places, he visited the leprosarium, where he saw many people suffering from leprosy. At one bedside he was introduced to a nurse who was cleansing a large festering sore on a patient. He watched for a moment in fascinated horror, and then said "Sister Benedict, I wouldn't do that for a million dollars!"

She looked up at him for a moment. "Neither would I, Mr. Smith," she said quietly, and went on with her work.

There are many jobs to be done in the world, and each of them can be honorable and important. There are many kinds of abilities among people, and the most important task the world has is to use each individual to the best of his particular abilities. The dignity of the individual is a precious thing and must be maintained at all cost. To do it we must realize that all really big jobs are done by team-work, and that all members of the team are essential and important.

In football we have learned to evaluate properly the work of the guards, for example, and not to give all the credit to the running backfield. So in the work of the world we must properly evaluate and give credit to the work of all the individuals who cooperate to get the job done.

The world has been searching for a long time for the cause of cancer. Some day it will be discovered. The papers will make much of the discovery, and will hail the discoverer as a great scientist. I would not want to detract in the least from his fame, but who is to say that the man who put the last screw into the microscope which the scientist used did not contribute as much to the discovery as the scientist who looked through the microscope? The men and women who designed the microscope, those who built and assembled it, those who prepared the chemicals for the experiments, those who furnished and equipped the laboratory, those who cared for the experimental animals, and those who tried earlier experiments which paved the way for ultimate success, all played equally important and necessary parts in the discovery.

As you go out into the world and take your places in one of the many branches of biology, you will be joining a team. Remember that you need the rest of the organization as much as, if not more than, they need you. Remember that each individual who is using his abilities to the full, in whatever capacity, is contributing to the team work so necessary in modern society.

If the study of heredity and environment has taught us anything at all, it is that no two human beings are exactly alike. Different people have different abilities, partly due to their inherited factors, and partly due to the particular environments in which they have lived and developed. Some people are best equipped by nature and experience to follow certain lines of endeavor. Not only lack of success, but personal unhappiness may result from following a line of work for which you are not well fitted. One of the advantages of a college training is that it has given you an opportunity to learn something about many fields of work, and thus to have made a more intelligent choice.

But to go back to human variability and individuality. To think for a moment in terms of heredity alone, your hereditary make-up is determined by the hereditary factors, or genes, which you carry on the chromosomes in your cells. Each human being has about 25,000 pairs of hereditary factors. Each of these pairs of factors is subject to biological change, which we call mutation. If there is in the world a mutation of each of only 200 of these genes, the number of different combinations of these changes would be 1 followed by 143 zeros, a number far beyond our comprehension. This number far exceeds the total number of people who have ever lived. When you add to that the variations which may be superimposed by environment, the number of different kinds of people based on only 200 mutations is truly beyond comprehension.

Actually, we know mutations in human beings in far more than 200 pairs of factors. The possible genetic diversity alone in the people of the world is almost infinite.

Take one example. You have probably studied the blood groups which are so important in transfusions. They are the result of certain chemical substances found in the red cells of the blood. There are at least 30 such substances known, and they are very strictly inherited. But the number of combinations of these 30 substances which can occur in us is enormous. There are more than two billion different blood groups known, each one being one or another of the possible combinations of these 30 blood substances.

Each of you belongs to one or another of these two billion blood groups. It would be possible for me to take one drop of blood from each of you here tonight, and in my laboratory I could in a short time classify each one of you into one or another of these two billion groups. It would be surprising, indeed, if any two of you fell into the same group. Then, ten years from now, we could all gather again at a 10th reunion, and I could again take a drop of blood from each of you. Without labeling the drops of blood at all, I could identify each one of you, merely by referring to my previous list, except for such duplications of blood group as might happen to occur among you.

Now the blood groups are strictly genetic, and not at all influenced by the ordinary variations in the environment. Consider, then, how much more variable and diverse must be such things as intelligence, special abilities, and personality, where not only many hereditary factors are concerned, but environmental influences as well. We all have certain fundamental traits in common. We are all human beings, we have backbones, limbs, body organs, brains and so on. But each of us is an individual, different in many ways from every other individual. It is of primary importance that each one evaluate his own peculiar abilities, potentialities and possibilities, and set his own course along the lines he is best fitted to follow.

Fortunately there are available good vocational ability tests and guidance procedures for such purposes. Presumably most of you have already chosen biology for a life work in a general way, and have prepared yourselves along appropriate lines. But you will still have to decide the phase of that work into which you should go, whether museum activities, medicine, forestry, field work, teaching, or research. It is possible now to receive expert guidance and advice in choosing the particular branch of your life work in which you have a reasonable chance of success. It is not too late to take such tests, and it may be well to take full advantage of such guidance procedures. It is far easier to avoid starting up the wrong trail than it is to retrace your steps and start again. It is well to be sure just what you are best fitted for by your hereditary endowment and your past experiences. Tests of this sort are as yet far from perfect, but they do help.

It is interesting to note how widespread the use of such tests is becoming. There were two tramps who recently met on the road. One said to the other, "You know, I didn't just drift into this sort of thing. I took one of those vocational guidance tests." I hope you come out better than that.

There are so many interesting phases of every major field of endeavor that somewhere each one of you can discover the phase he is best equipped to tackle, and in the long run he will be happiest in that work.

You will recall the Greek myth of the giant Procrustes, who had only one guest room. He insisted that every guest fit his guest room bed exactly, and so he either stretched or lopped off each guest to an exact fit. There is too much of this in our life planning. Do not let anyone lop off your own special abilities, or stretch them out of shape. Make the most of the fact that you are an individual, with your own peculiar abilities to offer. But offer them to the team you are working with, and keep ever in mind that others, too, have much to offer you. The integrated mosaic of individual abilities is what forms the finished masterpieces in most of the work of the world today.

But in spite of your individuality, and although you have trod various and diverse pathways, I am sure that your instructors have tried to endow you in the process with at least one accomplishment in common: the ability to think clearly, analytically, and critically. Your election to Phi Sigma was predicated primarily on that ability. I hope that you will continue to exercise it throughout life. But may I throw out a word of caution?

When you are on your own, with this fine ability to be analytical and critical in your approach to problems, be sure that you really understand in each instance just what it is that you are attempting to analyze and constructively criticize, lest you fall into one of the many traps which may be set for the unwary. Let me illustrate what I mean. An efficiency expert recently spent an evening at the symphony. Upon his return home, he wrote a report on the performance, which I have had the opportunity of reading. I think you will enjoy and appreciate the following extracts from the report:

"For considerable periods the four oboe players had nothing to do. Their numbers should be reduced, and their work spread more evenly over the whole of the concert, thus eliminating peaks of activity.

"All the twelve first violins were playing identical notes. This seems unnecessary duplication. The staff of this section should be drastically cut; if a large volume of sound is required, it could be obtained by means of electronic amplifier apparatus.

"Much effort was absorbed in the playing of demi-semi-quavers. This seems an excessive refinement. It is recommended that all notes should be rounded up to the nearest semi-quaver. If this were done, it would be possible to use trainees and lower-grade assistants more extensively.

"There seems to be too much repetition of some musical passages. Scores should be drastically pruned. No useful purpose is served by repeating on the horns a passage which has already been handled by the strings. It is estimated that if all redundant passages were eliminated, the whole concert time of two hours could be reduced to twenty minutes, and there would be no need for an intermission.

"It is of course possible that if this were done there might be some reduction in attendance. In that event it should be possible to close sections of the auditorium entirely, with a consequent saving of overhead expenses such as lighting, heating and janitorial service.

"If the worst should come to the worst, the whole thing could be abandoned, and the public could go to another institution."

Need I urge you further to be judicious in your use of your critical analyses?

Again let me urge you to make the most of the fact that you are an individual, with your own peculiar abilities to offer. Never grieve over abilities you do not have. Find and develop those you do have. Perhaps you will let me tell a personal experience. Ever since my childhood I have been fascinated with birds. As a boy I was always wandering the fields and woods watching birds and trying to learn about them. When I went to college I thought I might become a professional ornithologist, and do research on bird life, habits, economic importance and so on. But I discovered when I was given the proper tests that I am color blind. It explained a lot of things in my past life.

Moreover, I see out of only one eye, and therefore cannot use binoculars or field glasses to advantage. But I have a good ear, and I can hear birds sing, so I went along with other ornithologists, and I learned bird songs and now I can recognize almost any bird in the country by a single chirp. As a result I was able to do research in bird songs. And I get a real pleasure out of my bird hunting, even though I have to do it by sound and not by sight. Moreover, I discovered that my ear training enabled me to play the piano by ear, and I get a great deal of pleasure out of that. I probably would never have developed that ability if I had been able to see like other people.

So I say to you again, never grieve over abilities you do not have. Develop to the fullest extent those you do have. Make a real effort to find your special talents. And make no mistake, each of you has something which he can do better than the average.

Never be afraid to go ahead along the line of your best abilities. There are many different jobs to be done in this world, and each one can be honorable and important. When you are old, the important question will be not "What did I do in life?" but "How honestly and thoroughly did I put everything I had into the job I did?" If you can answer that one satisfactorily, you will have been a success.

Rebecca Dragos has accepted a position as bacteriologist with Eli Lilly and Company, Indianapolis. She is supervising work in the tissue culture, assay, and safety test group of the poliomyelitis vaccine department.

A native of Michigan, Miss Dragos was graduated in 1945 from Fordson High School in Dearborn and received a Bachelor of Science degree from Western Michigan College in 1949. In 1950 she received a degree in medical technology from the Providence Hospital School of Medical Technology, Detroit. This year the University of Michigan awarded her a Master of Science degree in bacteriology.

Miss Dragos is a member of the Society of American Bacteriologists, American Society of Medical Technologists, Registry of Medical Technologists, and Phi Sigma, biology honor society.

THE BERMUDA BIOLOGICAL STATION

By Talbot H. Waterman

Secretary

Situated on the emergent peak of an isolated sea mount rising precipitously from the depths of the Western Atlantic Ocean, the Bermuda Biological Station at St. George's West, Bermuda, offers workers in the field of marine research the outstanding advantage of a truly oceanic position coupled with a coral reef fauna and flora rich in tropical and sub-tropical forms. As a result of its fortunate site, this laboratory permits ready access to the study of various problems in physical oceanography and oceanic biology scarcely to be approached elsewhere.

Thus along the south shore of the Bermuda Islands the fringing coral reefs give way so rapidly to deep water that within five to ten miles the 1,000 and 2,000 fathom lines may be surpassed. Consequently oceanic, bathypelagic and benthonic faunas are accessible literally within sight of the Biological Station. The north shore, on the other hand, is bounded by ten miles of lagoon and reefs where many aspects of reef geology and littoral ecology may be conveniently studied.

For the experimental biologist particular interest lies in the abundance of a number of important organisms. Among the algae, Valonia, Acetabularia and Caulerpa are easily obtained. Echinoderms occur abundantly, and the breeding seasons of various species in succession provide embryological material during most of the year. Amphioxus is readily available, and there are large numbers of diverse littoral fishes. Squids are numerous at certain seasons. Decapod shrimps are various teleosts are the commonest macroscopic forms obtainable from the bathypelagic fauna.

In addition, from the point of view of the whole North Atlantic circulation, Bermuda's location is of great strategic value, lying as it does East and South-east of important stretches of the Gulf Stream. Scientific recognition of this advantage is reflected in the program initiated just prior to World War II under the auspices of the Royal Society of London and in the Oceanographic Observatory of the Woods Hole Oceanographic Institution recently established at the Bermuda Biological Station (Nature, 173, p. 886, 1954).

Furthermore, the geographical location of the laboratory on the western edge of the Sargasso Sea provides a climate suitable for collecting and other field work throughout the year, a factor important not only for the biologist but also for the marine geologist and oceanographer. Despite these advantages of position, the station is only 660 miles (about three hours by air) from New York.

The Bermuda Biological Station operates primarily as a research facility for visiting investigators, although certain programs of investigation are conducted by the laboratory itself. It is open throughout the year to all qualified investigators concerned with any phase of marine research, whether biological, chemical, or physical, and to others conducting scientific investigation in the Bermuda Islands. A limited number of non-working visitors also may be accommodated as friends of the Station when space permits.

Support for the Station is drawn from the original endowment given by the Rockefeller Foundation, grants from the Bermuda Government, special grants and gifts from other sources, and by rents and fees.

The property of the Bermuda Station consists of a fourteen acre tract on St. George's Island and fronts on Ferry Reach. The main building contains offices, a lounge, dining room, laboratories, two apartments and about twenty single dormitory rooms. A second building houses additional laboratories, carpentry shops, and a storage loft. Other buildings on the property include the E. L. Mark Memorial Library, the Director's house, four cottages, and two dwellings which provide six small housekeeping apartments. A jetty, pump house, and tide gauge are located on the Ferry Reach Shore.

Eight laboratories in the main building and four in the new building accommodate from one to several workers each. In addition, one laboratory is fitted primarily for physiological work and contains routine chemical equipment. There are two darkrooms, a cold room, and a dry room. Running salt water with a salinity of about 35 o/oo is distributed to salt water tables on the verandas outside the laboratories and four large concrete tanks and two aquarium racks in the aquarium rooms. Outdoor tanks provide additional space for holding live material.

Small stocks of routine glassware and reagents are maintained and certain equipment, such as pH meter, microscopes, microtomes, balances, and cameras are available in limited quantities. All investigators, however, are requested to submit a detailed list of their needs before arrival, so that they may be advised of what is available. Certain supplies, such as preserving jars and vials, photographic materials, microscope slides and cover slips, and similar items are normally stocked by the Station for sale at cost.

A wide variety of collecting grounds are readily accessible from the laboratory, including coral reefs, rocky and sandy shores of varying degrees of exposure, shallow bays and lagoon, and mangrove swamps. Deep water can be reached within an hour's time.

The Station's equipment includes a thirty foot launch, fitted with a winch and live well. Gear, such as dredges, grabs, seines and nets of various sorts, water glasses, diving helmets, aqualungs and skiffs are available. At present, the Station has the use of a sixty foot research vessel, the PANULIRUS, on loan from the Bermuda Government. This ship is equipped with hydrographic and trawling winches, as well as a fathometer and radio-telephone. These two boats are in charge of experienced collectors, who assist investigators in the field or bring desired material to the laboratory.

The E. L. Mark Memorial Library contains a small number of journals, expedition reports, and standard works on biology and marine research. There is, in addition, a reprint collection.

Research fees for use of ordinary Station facilities are charged at a rate of $100 a month for a senior investigator and $50 a month for each assistant. The fee for graduate students is $50 a month. Projects making unusual demands on Station facilities, particularly on boat time, are charged an additional fee determined in each case by the Director in consultation with the investigator.

Single rooms in two-bedroom suites are available in the main building at $10.50 a week per person. Simply but completely furnished housekeeping apartments and cottages are rented to families or groups, and range in cost from $55 to $125 per month. Daily delivery of groceries and other supplies can be obtained from stores in St. George's at costs slightly higher than those of the United States. There are excellent medical and dental facilities in Bermuda.

Various Fellowships or Grants-in-Aid are available from time to time. The National Science Foundation has recently made a considerable grant to be used for financial assistance to investigators working at the Station. Applications will be considered from senior investigators as well as qualified graduate students.

Further specific information about the Bermuda Biological Station may be obtained from the Director, Dr. W. H. Sutcliffe, Jr., Bermuda Biological Station, St. George's West, Bermuda.

FRIDAY HARBOR LABORATORIES

By Kathryn M. Eschenberg

Central group of buildings used as laboratory classrooms

The Friday Harbor Laboratories, formerly known as the Puget Sound Biological Station, were established in 1904 by the University of Washington for the study of marine biology. Many improvements have been made since its early years, and, in particular, since World War II. Expanded facilities for instruction and research in biological problems have attracted increasing numbers of students and investigators to the summer program. The Laboratories are located about eighty miles from Seattle, on San Juan Island, one of the largest of the San Juan Archipelago. This complex of islands affords a remarkable variety of biotic situations, readily accessible from the Laboratories. Mud and sand flats, protected rocky coasts and reefs, shallow bays, lagoons, salt marshes, deep fjords, open rocky coasts, and surf-exposed sandy beaches support an immensely rich and varied flora and fauna. A wooded 484-acre state game preserve is the site of the laboratory buildings, all within easy access of each other. These include four biology classroom and research buildings, all equipped with desks, work tables, spacious water tables, and aquaria. Constantly running sea water, free from metallic contamination, is supplied to the aquaria through a unique all-glass system. The exceptional purity of the water permits prolonged maintenance in the laboratories of the most sensitive organisms. In addition, floats attached to the nearby dock are provided with live boxes in which large numbers of animals may be kept. Also available at the dock are six light-weight Fiberglas rowboats, for use in collecting at nearby areas. Two small power boats may be used by qualified persons for light dredging, plankton collecting, and transportation to more distant regions. In addition, a 55-foot diesel-powered trawler, fully equipped for deep dredging and otter trawling, is provided for class and research use daily throughout the summer. With a choice among these facilities, investigators can be assured of speed, efficiency, and care in collecting operations.

Other working facilities include a stockroom, equipped to provide standard chemicals, glassware, and scientific apparatus. The Laboratories are usually able to provide optical equipment, such as microscopes, colorimeters, spectrophotometers, and other special apparatus, such as Warburg respirometers, high-speed centrifuges, and Geiger counters, when advance notice of such needs is given. A large, modern shop, with power tools and glass-blowing equipment, is available to all workers, as are several darkrooms.

The University of Washington maintains a 6,000-volume branch library at the station, housing standard reference works, journals, and extensive reprint files. Other books may be readily obtained through this branch from the Seattle campus libraries.

Housing and research accommodations are available to independent investigators throughout the year. In addition, during the Summer Quarter, a varied program of formal course instruction is offered in zoology, botany, oceanography, and meteorology. The courses are primarily on the graduate level, although advanced undergraduates with adequate experience may be accepted. The formal period of instruction extends over ten weeks, from the third week in June through the fourth week in August. The quarter is divided into two five-week terms, during each of which a student devotes full time to a single course. It is possible to attend the Laboratories during either five-week period, for a maximum of six quarter-hours of credit. Preference, however, is given to those who wish to spend the entire summer. Normally, two five-week courses are presented in Zoology and two in Botany. Classes are small, the maximum number of students in any course being twelve or less. The Zoology courses are usually staffed by a member of the University of Washington faculty, a visiting professor, and a teaching assistant. Every student, therefore, receives ample guidance, in accordance with his experience and interests. The number and kinds of lectures, field trips, and laboratory work are determined by the nature of the course. In every case, students are encouraged to pursue their special interests informally and in the development of an individual research problem. The Zoology course offerings include Advanced Invertebrate Zoology, Advanced Invertebrate Embryology, and Advanced Invertebrate Physiology, the latter two being offered in alternate years. The course in Invertebrate Zoology provides an extensive survey of the invertebrate fauna of the San Juan Archipelago, stressing systematics, ecology, and, to a more limited extent, behavior. It is anticipated that the student will have had a basic invertebrate zoology course including morphology and phylogeny as background for this course. Special assistance is given to those students whose experience is inadequate for the established course level. Much of the time is spent in the field — observing and collecting animals in their characteristic sandy, mud, or rock habitats, on San Juan and nearby islands. In addition, considerable attention is devoted to deeper water forms obtained by dredging to depths of 100 fathoms or more, and to forms collected at the night light and in plankton tows. Laboratory work centers chiefly upon the identification of these animals. A two-day boat trip to an exposed Pacific Coast reef has climaxed the field work in this course.

Advanced Invertebrate Physiology will be offered in the summer of 1955. This is essentially a laboratory course with a minimum of field work. Here, the emphasis is placed upon the physiological aspects of ecology, evolution, and tolerance to stress among various marine invertebrates. Considerable latitude is allowed the student in his choice of experimental problems. Experience in the use of special physiological apparatus, such as the oscilloscope and Warburg respirometer, is one of the major assets derived from this course. Lectures and discussions supplement the laboratory work. The prerequisites for the course include chemistry through organic and ten credits in invertebrate zoology.

Advanced Invertebrate Embryology, offered next in 1956, stresses the descriptive and comparative aspects of the development of marine invertebrate types, including all the major and many of the minor phyla. In addition, there is some work upon the problems of experimental embryology, including artificial parthenogenesis, embryonic regulation, polarity, and regeneration. An adequate background for this course includes invertebrate zoology and vertebrate embryology.

The two botany courses offered each summer are Algology and Problems in Algal Physiology. These are staffed by one professor and one teaching assistant. The Algology course offers lectures, field, and laboratory experience in algal systematics and morphology, with the emphasis upon marine forms. The field work includes both intertidal and sub-tidal collecting. Again, as in the zoology field course, a two-day boat trip to the open coast has afforded the opportunity to study forms not encountered in the San Juan area. Beginning botany is the prerequisite for this course.

The problems undertaken in Algal Physiology depend to some extent upon the experience and interests of the students taking the course. In addition to those of a general physiological nature, phenomena peculiar to marine algal metabolism are considered. The characterization of photosynthetic pigments, starch formation, and carbon monoxide production are typical among the problems investigated. Prerequisites include a course in plant physiology and chemistry through organic.

In addition to the courses described above, a student may undertake research problems for a variable number of credits, under the direction of staff members. The Department of Oceanography presents two courses during the summer, which may be of interest to biologists. Detailed information about these may be obtained from the Director of the Laboratories. It should be emphasized that students are not obliged to pursue the two-course sequence offered by any one department. They are free to choose whatever program best fits their needs among the various fields, providing they have the necessary qualifications for acceptance. The staff will seriously entertain suggestions or requests for courses not offered at present. For example, a course in advanced invertebrate morphology is under consideration, providing sufficient interest is indicated.

Outside of the formal course offerings, weekly evening biology research seminars are presented by staff members and visiting investigators. The informal atmosphere at these and other gatherings, engendering the friendly inter-change of ideas, provides some of the most rewarding, albeit less tangible, experiences to be gained during one's stay at the Laboratories. During the past summer some twenty-two advanced investigators and twenty-eight students in oceanography and biology shared their interests while attending the session.

Although most students find little time for relaxation except on weekends, numerous recreational facilities are available to both adults and children. Ping-pong, volley ball, square dancing, movies, boating, fishing, and beach parties are among the most popular activities.

Various types of comfortable living accommodations are maintained on the Laboratory grounds. There are ten modern, two-bedroom cabins for the use of the staff, investigators, and students with families. These are completely equipped with furniture and food utensils, exclusive of linens. In addition, five duplex frame buildings house married couples or families who wish to eat in the dining room. Each of these units consists of one large and one small room, with wood stove and essential furniture. There are no cooking or washing facilities connected with the duplexes. Single students may choose between tents and dormitory buildings for living accommodations. The tents are supported on wood platforms and are supplied with electricity and essential furniture. Each tent accommodates one or two people. The dormitory buildings are composed of four sleeping-rooms for one or two occupants and a large central study room heated by wood stove. Washing and eating facilities for those living in duplexes, dormitories, and tents, are conveniently housed in a central building, along with the dining hall. Three meals are served daily throughout the summer, and sack lunches are provided for those doing field work at meal times. Laundry facilities, including automatic washers and driers, are also maintained by the Laboratories.

Expenses for the summer vary chiefly with the type of living accommodations. During the past summer, housing fees for the entire quarter were as follows: cabins, $135; duplex units and dormitories, $28 per person; tents, $22 for single occupancy, $13.50 per person for double occupancy. The board fee for the entire summer quarter was $130. For both resident and non-resident students, tuition fees total $65.00. Research space in the laboratory buildings for investigators not enrolled in courses is $25. The total expenses for a single student living in a dormitory or tent, amount to approximately $225 for the summer. The laboratory has a limited number of part-time jobs available to students or members of their families.

The official bulletin and additional information may be obtained from the Director of the Friday Harbor Laboratories, c/o Department of Oceanography, University of Washington, Seattle, 5, Washington.

THE UNIVERSITY OF MICHIGAN BIOLOGICAL STATION

By A. H. Stockard, Director

The University of Michigan Biological Station, one of the oldest and largest of American biological stations, was established in 1909 as a unit of the Summer Session and has operated for eight weeks during each of the 46 summers since its beginning. Its founding was inspired through the combined efforts of Professor George Burns, then in the Botany Department, and the late Professor Jacob E. Reighard, of the Department of Zoology of the University of Michigan, who wisely foresaw both the necessity of carrying the study of biology into natural situations and the advantages of the site which they selected.

The Station is located in the northern tip of the Lower Peninsula of Michigan, within easy reach of more than 200 inland lakes and three of the Great Lakes—Superior, Michigan and Huron. Here, north of the 45th parallel in a superb summer climate whose temperature during the session seldom falls below 60 degrees nor rises above 85 degrees, and in a sparsely settled, immense rural area, varied in topography and richly populated with plant and animal species, opportunity for summer biological study under pleasant conditions is unexcelled.

Though the Station enjoys the advantage of isolation in an extensive area of undeveloped land and lakes, it is easily reached by hard surfaced roads from nearby towns. Cheboygan, Michigan, the city of postal address, on U. S. 23 and 27, is 12 miles to the northeast on the Straits of Mackinac. Pellston, the village of telephone, telegraph, airline, express and freight address, and served by Capital Airlines, is 6 miles to the west, on U. S. 31. Petoskey, Charlevoix, and Traverse City, famous resort cities on Lake Michigan, are 23 to 80 miles to the southwest; and historic Mackinaw City, Saint Ignace and Mackinac Island, on the Straits of Mackinac, are about 25 miles to the north.

The Station occupies an 8,850 acre tract of land owned by the University of Michigan, in Cheboygan and Emmet counties. The tract lies between Burt Lake and Douglas Lake, with about 8 miles of shoreline on the two lakes. In addition to this tract, many sites of biological interest within a 100-mile radius are regularly used for study. Because of the location in the transition zone between the coniferous forests to the north and the hardwoods to the south, and in the region of overlap between the eastern and the western biota; because of the great range in topography, from the Great Lakes and large and small inland lakes and streams, through marshes, bogs, and lake plains, to old beaches, uplands, glacial moraines and fixed and moving sand dunes, and because of the many types and stages of vegetational successions due to emerging land, farming, lumbering, forest fires and plantings, the variety of situations and of plant and animal species and associations available for study is immense.

The Station campus is a "village" with 144 buildings, and has streets and electric, water and sewerage systems. It occupies about 30 acres of wooded terraced shore on the southeast bay of Douglas Lake. Ninety-six of the buildings are residential, mostly single-room houses, furnished, except

for pillows, blankets and linens, to accommodate two or three persons each. The remaining 48 buildings include a health unit, dining hall, laundry shower buildings, lecture hall, store and postoffice, library, aquarium, animal house, boat house and 18 laboratories, all suitably equipped and supplied. In addition, there are courts for games and dancing; audio-visual equipment for music and lectures, adequate boats, launches, station wagons and buses for transportation, and cages, driers, ovens, microscopes, chemicals and various other types of equipment and supplies for scientific work.

The Station provides for all of the essential ordinary needs of its members. Medical service is rendered through a resident physician. The dining service is under the management of a professional dietitian; the meals are excellent. Organized recreation is under the supervision of the Dean of Women, a trained social director. Its 250 members, therefore, are able to live comfortably and happily while studying in a pleasant summer location.

An integral part of the University of Michigan and a unit of its regular Summer Session, the Station is operated under an Executive Committee, composed of Dugald E. S. Brown, Ph. D., Chairman of the Department of Zoology, Stanley G. Fontanna, B.S.F., Dean of the School of Natural Resources, Kenneth L. Jones, Ph.D., Chairman of the Department of Botany, and Alfred H. Stockard, Ph.D., the resident Director of the Biological Station.

Though the Station is a part of the University of Michigan, its faculty members are chosen for their proficiency in the particular phases of biology in which they are to conduct courses and research, regardless of any other affiliation with the University of Michigan. This policy has enabled the Station to build up a relatively permanent faculty of outstanding members from many colleges and universities. While the faculty members and courses for 1955 have not yet been chosen, the membership, courses and research fields probably will differ little from those of 1954, which were as follows:

1. Elzada U. Clover, Ph.D., Associate Professor of Botany at the University of Michigan — Taxonomy of the Flowering Plants (4 semester hours) and Investigations in the Classification of Flowering Plants.

2. Frank Caleb Gates, Ph.D., Professor of Botany at Kansas State College — Plant Ecology (4 hours) and Investigations in Ecology of Flowering Plants.

3. Andrew John Sharp, Ph.D., Professor of Botany at the University of Tennessee—Bryophytes (2 hours) and Lichens (2 hours), and Investigations in Taxonomy and Distribution of Lichens and Bryophytes.

4. Gilbert M. Smith, Ph.D., Professor of Botany at Stanford University — Fresh-water Algae (2 hours) and Morphology and Biology of Algae (2 hours), and Investigations in Taxonomy, Life Histories, and Ecology of Algae.

5. Frederick K. Sparrow, Jr., Ph. D., Professor of Botany at the University of Michigan—Lower Fungi (2 hours) and Aquatic Flowering Plants (2 hours), and Investigations in Aquatic Fungi and Aquatic Flowering Plants.

6. Stephen H. Spurr, Ph.D., Professor of Sylviculture at the University of Michigan — Investigations in Sylvics.

7. Paul C. Beaver, Ph.D., Professor of Parasitology at Tulane University — Biology of Parasites (with Prof. Cort; 4 hours) and Parasitological Methods (2 hours), and Investigations in Parasitology.

8. David C. Chandler, Ph.D., Professor of Zoology at the University of Michigan — Limnology (4 hours) and Investigations in Limnology.

9. William W. Cort, Ph.D., Professor Emeritus of Parasitology at Johns Hopkins University and Research Professor of Parasitology at the University of North Caroline—Biology of Parasites (with Prof. Beaver; 4 hours) and Investigations in Helminthology.

10. Charles W. Creaser, Ph.D., Professor of Zoology at Wayne University — Biology of Fishes 9 (4 hours), and Investigations in the Biology of Vertebrates and Investigations

in the Biology of the Great Lakes.

11. Frank E. Eggleton, Ph.D., Professor of Zoology at the University of Michigan — Natural History of Invertebrates (4 hours) and Investigations in the Natural History of Invertebrates.

12. Herbert B. Hungerford, Ph.D., Professor of Entomology at the University of Kansas — Entomology (4 hours) and Investigations in Entomology.

13. Olin Sewall Pettingill, Jr., Ph. D., Associate Professor of Zoology at Carleton College — Ornithology (2 hours) and Advanced Ornithology (2 hours) and Investigations in Ornithology.

14. Alfred Henry Stockard, Ph.D., Professor of Zoology at the University of Michigan and Director of the Biological Station — Investigations in Vertebrate Morphology.

15. Frederick H. Test, Ph.D., Associate Professor of Zoology at the University of Michigan — Biology of Terrestrial Vertebrates (4 hours) and Investigations in Natural History of Vertebrates.

In addition to the courses and fields of investigation listed above, courses and research on the higher fungi, pteridophytes, gymnosperms and protozoans often are included.

The courses are built in method and content to fit the situation. Each course meets throughout each day assigned to it, 2-hour courses meeting on one day per week and 4-hour courses meeting on two, thus allowing greater freedom for field trips. Only the types of studies better accomplished at a field center than on an urban campus are given. Each course is centered on a major group of plants or animals, or on a major ecological system. Taxonomy, distribution, population changes, behavior, relationships within and among the several species of organisms, and their relationships to physical factors in the environment are emphasized. All of the courses and correlated special lectures are directed towards the central objective of developing an understanding of the effects of the interactions among all of the physical and biological natural forces in the region.

The research program, an extensive one, likewise is shaped to the field situation. All projects which are best suited to an inland-freshwater rural location are encouraged. All of the areas represented by courses, and many areas not so represented, are centers for projects by faculty members, investigators and graduate students. The projects fall naturally into a pattern of extending the knowledge in the several areas and of coordinating it with that in other areas. The degree of activity of the program is evidenced by the fact that each year between 75 and 100 projects are pursued, resulting in between 20 and 30 published articles each year. The total number of publications based on research at the Station now exceeds 850.

Though many of the research areas are noteworthy, of special interest is the program on the Great Lakes. Instituted in 1954, and sponsored by the Great Lakes Research Institute of the University of Michigan, with the cooperation of the Department of Lands and Forests of the Province of Ontario, Canada, this program is centered at the Station and many of its members participate. The program in 1954 was devoted to a synoptic survey of the physical characteristics of Lake Huron. In 1955 this survey will be extended to Lake Michigan, and a study of the biological features of Lake Huron will be undertaken, to be extended to Lake Michigan in 1956. It is hoped that Lake Superior will be brought under study in 1957.

All students, both undergraduate and graduate, and all professional biologists interested in the type of courses or research available at the Station, regardless of their residence are eligible to apply for admission. Two collegiate courses in biological science are required for admission to any of the courses, and some require more and special training. Accommodations for small families, as well as for single men and women, are available.

The enrollment usually totals about 130, of whom approximately 35 are undergraduates, 75 are graduates and 20 are investigators. Michigan residents usually comprise about 40 per cent of the total, the other 60 per cent coming from as many as 30 other states and foreign countries. All live in small houses, all eat together in a common dining room and all share in the community entertainment program. The community style of living, which facilitates friendliness and easy relationship in the mixed and cosmopolitan group of biologists and their families, the comfortable quarters, the excellent meals, and varied and interesting entertainment, and recreation, the pleasant and stimulating climate and the attractive surroundings all provide a most favorable atmosphere for both productive study and happy associations.

The regular session begins near the last week in June and continues until about the middle of August — June 18 to August 13 in 1955. Investigators and research students are welcome at other times, as well, under special arrangements. The costs for the regular session of eight weeks to students and investigators are $65 registration (including housing and health service) for residents of Michigan, and $125 for non-residents, plus $130 for board. Dependents are charged $21 for room and health service, plus board, $130 for adults and $78 for children under 8 years of age. Interested students or investigators should write to Biological Station, 2125 Natural Science Building, University of Michigan, Ann Arbor, Michigan, for further information.

THE MOUNTAIN LAKE BIOLOGICAL STATION

By Bruce D. Reynolds, Director

The Mountain Lake Biological Station is an integral part of the University of Virginia, although it is regional in the sense that all pay the same fees. Its purpose is to provide a place where advanced instruction and research in the field of biology can be carried forward under favorable conditions during the summer months. It is designed especially to serve those living in the Southeastern States, but in the past the Station has attracted students and investigators from most of the states in the Union. Many return from year to year, and thus the Station has become an ideal place to meet old friends and to make new ones. These contacts with other biologists constitute an important feature of the Station.

The summer work is divided into two terms of five weeks each, with classes meeting six days a week. Four advanced courses in biology are offered each term. The terms are independent of each other and students may register for either or both. For those who contemplate becoming candidates for degrees, both terms are advised.

Registration is open to men and women who have a minimum of twelve semester hours of college credit in biology. Courses may be taken either for graduate or undergraduate credit, but they are designed primarily for those working toward advanced de-

MOUNTAIN LAKE BIOLOGICAL STATION
A group standing in front of the laboratory.

grees. Some of the courses should be of particular interest to teachers of biology in high schools and colleges, while others should prove beneficial to public health workers and to those interested in conservation problems.

Mountain Lake is located in Giles County, Virginia, at an elevation of nearly 4,000 feet above sea level. This natural lake is situated on the top of Salt Pond Mountain. It is a body of clear water with a surface area of approximately 100 acres and a maximum depth of 110 feet. Rising from its shores, Bald Knob peak reaches an altitude of 4,363 feet, one of the highest points in the Virginia Alleghanies. Extensive stretches of wooded, mountainous terrain surround the lake and in the vicinity are freshwater streams, one of which tumbles over rocks 70 feet high to form the beautiful Cascades. Within a radius of five miles collections can be made from places with a difference of 2,500 feet in altitude. The mean temperature for the summer months is approximately 66 degrees, the nights being remarkably cool, and the mid-day temperature seldom rising above 80. The temperatures for a typical summer were as follows:

	Maximum	Minimum
High (day)	85.5	62.0
Low (night)	61.0	41.0
Average	77.4	54.7

The site of the Station is on a wooded ridge one mile north of the lower end of the lake. It consists of a tract of about 1200 acres on top of the divide between the Atlantic and the Gulf drainage areas. The land was made available through the generosity of the late John B. Laing, and Mr. and Mrs. James W. Wiltshire.

There are two roads leading from U. S. Highway No. 460 to Mountain Lake. Virginia No. 700, about two miles northwest of Newport, is hard-surfaced and is the one recommended. The other road leaves U. S. No. 460

at Hoge's Store, about one mile southeast of Pembroke. It is an all-weather road but is not hard-surfaced. The two roads unite at the top of the mountain near the hotel. Persons coming to the Station should proceed along the left side of the lake for a distance of about two miles beyond the hotel, taking all right-hand forks.

The main laboratory building is a stone structure containing class rooms, library, herbarium, museum, auditorium, constant-temperature room, dark rooms, culture rooms, offices, stock rooms, and private research rooms. It is supplied with electricity (110-A. C.), running water, microscopes, microtomes, autoclaves, sterilizer, incubators, embedding ovens, centrifuge, stains, glassware, and other equipment used in general work. Special apparatus will be provided to the extent of funds available for that purpose.

Living accommodations are provided in one-story cottages. Single or double rooms and suites are available. Most cottages have an open fireplace in the living room, and all have electric lights, lavatory, toilet, and shower. Water is obtained by gravity from a spring nearly a mile distant. A swimming pool, conveniently located, was the gift of the late Frederick L. Schoew of Huntington, West Virginia. A wading pool for children was built in 1948. Also badminton, tennis, and volleyball courts are conveniently located.

There are dormitories for men and for women students. All are expected to furnish their own towels, bed linen and blankets. The chilly nights necessitate warm covering.

Dormitory room rent is $2.50 a week (two in a room). Cottages and apartments are available for families at prices ranging from $6.00 to $12.00 a week. Housekeeping facilities are not provided, as all adults and children, two or over, take their means in the common dining room.

The mess is run on a non-profit basis. Board usually is $12.50 per week. Children under six are charged one-half price if brought into the dining hall.

The informality of life at the Station renders an elaborate wardrobe unnecessary. Suitable clothing and heavy shoes for hiking should be brought. Warm sports clothes and leather boots are desirable.

Relatives and friends of students may find accommodations at the Mountain Lake Hotel, which is at the south end of the lake, two miles from the Station.

Fees are relatively low and are the same for out-of-state students as for Virginians. Tuition fees for course work are $40.00 per term and research fees only one half that.

Again for 1955, funds will be available from a grant made by the National Science Foundation to promote research at the Station. Awards are made by a committee of biologists residing in several states. Persons interested in applying for awards should write to the Director, Mountain Lake Biological Station, Biology Building, University of Virginia, Charlottesville, Virginia and ask for instructions.

A few institutions have established scholarships and fellowships for attendance at the Mountain Lake Biological Station. These will be awarded by the institutions establishing them. A Research Fellowship of $200 has been established by Phipps & Bird, Richmond, Virginia, to be awarded through the Association of Southeastern Biologists. Opportunities for self-help are limited but are available for some students in the dining hall and laboratory.

THE UNIVERSITY OF OKLAHOMA BIOLOGICAL STATION

By Carl D. Riggs, Director

The University of Oklahoma Biological Station is a permanent field station designed and operated to offer opportunities for study and research in ecology and natural history, and those phases of taxonomy, evolution, morphology, and physiology that require extensive study of organisms in their natural habitats. Annual summer sessions are held in June, July, and early August. Though located 125 miles from the main campus of the University of Oklahoma, the Biological Station is an instructional and research unit of that institution and subject to the general rules and regulations thereof. It was established in 1950 on the north shore of the Red River arm of Lake Texoma at the mouth of Buncombe Creek, two miles east of Willis, and 14 miles south of Madill, Marshall County, Oklahoma. From the standpoint of biological study, its central location on the lake is ideal, putting it in close proximity to many types of habitats both terrestrial and aquatic.

Lake Texoma is an impoundment of the Red and Washita rivers, formed by the Denison Dam, at Denison, Texas. The reservoir was filled to power pool level (617 feet above sea level) by 1945. The lake at power pool level has a surface area of 93,080 acres, a capacity of 5,715,700 acre feet, and a shoreline of approximately 700 miles. Its drainage basin occupies 38,291 square miles in Oklahoma and Texas.

Since the lake is primarily for flood control and also used for hydro-electric power, areas of its shoreline are alternately inundated during periods of high water, and exposed by drawdown. The constantly changing environment created by these water fluctuations offers many interesting and vital ecological problems.

The biotic province in which Lake Texoma and the surrounding region are located is characterized by tall grass prairies and blackpack-post oak forests. Bottom land and flood plain vegetation is found along many of the tributary streams. Low limestone hills covered with sand, clay, loam, or a mixture of these, often with extensive stone outcrops, are abundant as are plains and valleys with similar soil types. Cultivated fields of various crops, eroded areas in beginning to advanced stages, permanent and intermittent streams, farm ponds, and marginal wet lands all abound in the vicinity.

The fact that this station is located on a man-made lake in an area with a great variety of both aquatic and terrestial environments where there has been little biological investigation, greatly enhances the research opportunities which are unlimited for both botanical and zoological study. The biology of reservoirs such as Lake Texoma is only slightly known including such fields as fishery biology, limnology, aquatic entomology, aquatic botany, and invertebrate zoology. Its large and diverse fish population accompanied by many aquatic or water-haunting birds and mammals offer many vital problems for taxonomists and ecologists as well as a wide and relatively unexploited field for parasitologists. Several large, well isolated islands in the lake, each occupied by extensive flora and fauna, including fish, amphibians, reptiles, birds, and mammals, are ideal for population studies. On the largest of these islands are five small lakes or ponds, and several inlets which become isolated from the main lake at times of low water.

It is impossible at the present time to list the number of species of plants and animals that occur in the region. Too little is known. Intensive collecting and research in the area began in the summer of 1949 and many species of plants and animals, both invertebrate and vertebrate, were new records for the county or even for the state. Collections made by both staff members and students since 1949 have extended the ranges of many species and added several new records.

The Biological Station herbarium now contains over 500 species of flow-

New Laboratories

ering plants representing 274 genera and 92 families. Additional forms are added almost every field trip.

The study of the parasites of animals in the region has revealed many new host and distributional records, as well as new species records of parasites. It has been possible to make studies of only a few of the many host species available. Since few parasite studies have been made in the state, opportunities for taxonomic, distributional, and life-cycle studies on parasites are practically unlimited.

Several thousand insect specimens have been classified representing well over 150 families. Numerous inconspicuous forms remain completely unclassified as yet — especially among the flies, caddisflies, and beetles. No detailed taxonomic work has yet been undertaken. Among the many groups of invertebrates collected, a small beginning has been made toward a study of the spiders, scorpions, crayfishes, and snails. At present, the insect and invertebrate collections are in a pioneer stage, as yet uncatalogued. To the student, this is not a detriment, but a challenge, since he can find something "new" at every turn and can feel with sincerity that he is contributing to knowledge of the fauna of Oklahoma.

Of the vertebrates, 67 species of fishes, 16 of amphibians, 42 of reptiles, 154 of birds, and 32 of mammals, including beaver, armadillo, cyote, and whitetail deer were seen or collected and comprise an excellent beginning for the vertebrate faunal list. Many of these were new records for the area and even for the state.

Available Facilities for Teaching and Research

The physical plant of the Biological Station consists of eighteen buildings. The most important of these are: the main building, which includes two laboratories and accessory rooms, a photographic darkroom, an aquarium with outdoor and indoor tanks, a kitchen and a dining hall, men's and women's dormitories, a library, and study and work rooms for advanced students; the laboratory building, containing three new laboratories (all laboratories are large and well-equipped for most types of ecological and taxonomic research); the faculty apartment building; ten living units

Invertebrate Natural History Class in the field

Night work for the Vertebrate Natural History Class

for married students and families; the water filtration plant; and the boathouse.

Laboratory equipment includes compound and dissecting microscopes, microtomes, centrifuges, drying and preparation ovens, electrical resistance thermometer, spectrophotometer, pH meter, conductivity bridge, glassware, chemicals, and many other items.

Field equipment consists of launch, boats with outboard motors, cameras, field glasses, collecting equipment, cages and pens, chemistry kits, and much other ecological and limnological equipment.

The collections previously mentioned are teaching and research collections. These collections will be expanded until complete, and students and investigators are encouraged to add to the collections whenever possible.

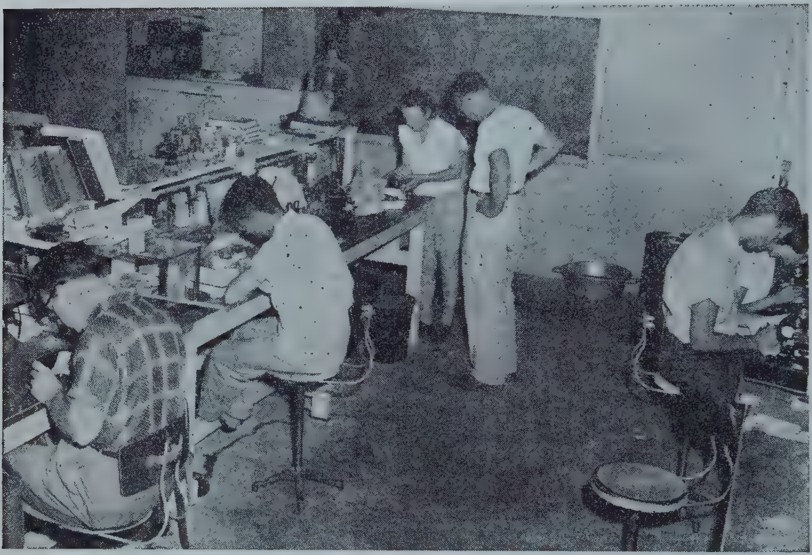
With very few exceptions, transportation by boat or truck is furnished without extra cost for all class field trips. The commissary provides meals on such trips. Although field trips usually extend through a half-day or a day, overnight trips are also taken.

The facilities of the University of Oklahoma Biological Station are available to independent investigators during the regular sessions, and at all other times during the year. Faculty members of the Station are available for advice and help on research problems, and consultation with all staff members of the departments of Plant Sciences and Zoological Sciences, at Norman, may be had by correspondence or personal contact.

General Living Conditions

A sincere attempt has been made to create and maintain adequate and comfortable living conditions. Although often plain and simple, necessary facilities for health and comfort are available. Cats and dogs cannot be kept at the Station, and firearms are prohibited except on written permission by the director.

Students and investigators live in dormitories equipped with running



Parasitology Class at work in the laboratory

water, electricity, and heat. Showers, lavatories, and toilets are furnished as are beds, lockers or closets, chairs, tables, mirrors, and other minor furnishings. Bedding, such as sheets, pillow cases, and blankets, and toilet articles including towels and wash cloths must be provided by the occupants. The dormitory for women is divided into two- and three-room units. The one for men is a single large unit.

Meals are served cafeteria style in a large dining hall. Board is provided by the commissary and is supervised by the Counselor of Women and the Commissary Committee. Lunches are provided for field trips and certain recreational activities.

Outdoor recreation such as fishing, boating, swimming, softball, volleyball, badminton, horseshoes, hiking, and picnicking is readily available and necessary equipment is furnished. The dining room is used for movies, lectures, music, dancing, and indoor games. A lounge and sundecks are also provided.

A first aid station with facilities for care of minor ailments and injuries is available. A doctor in Madill is on call at all times.

The Counselor of Women for the Station is in charge of the dining room and organized recreation. She also supervises the women's living quarters and is available for advice and counsel.

Private automobiles may be kept at the Station and used subject to liberal regulations. They are useful for private field trips, church going, and town trips. Cover for private automobiles is not provided by the Station. Transportation for all regularly scheduled class field trips is furnished by the Station. A free taxi service is furnished for those arriving by bus or train, but only at time of arrival.

Fees and Expenses

A general fee covering normal laboratory supplies, library, and regular field trips, must be paid at registration by each student. The fee for each regular session at the Biological Station is $40 for all students. Non-residents must pay an additional fee of $60. There is no reduction in the fee for students registering for less than the full program. The general fee for independent investigators is $40 for the full session. Investigators attending for less than the full session must pay a fee of $5 each week. Investigators have full access to all privileges and facilities of the Station.

The Biological Station Commissary provides board and room at a cost of $110 for the regular session for adults and children over eight years old. The charge is $65 for children 5-8 years old, and $45 for children 3-5 years of age when food for the latter is provided by the commissary. There is no regular charge for children under three. When special diets are required, additional charges may be levied. Dependents of students and investigators must pay a room fee of $12 for the full session or $2 each week if attendance is only part-time. The board and room fee must be deposited at registration. Refunds of the unusued part of the fee will be made to those who do not remain for the full session.

A social fee of $1 for each adult and child over 8 years old, and of 50 cents for each child 2-8 years old is collected by the Social Committee at registration. This is to cover the cost of organized entertainment and recreational equipment.

Assistantships, Scholarships, and Employment

At least three assistantships are available to graduate students each summer at the Biological Station. These pay the non-resident fee, and a monthly salary, the amount of which depends on the academic level of the student.

Several scholarships of $150 each, provided by the University of Oklahoma Foundation, are available to both undergraduates and graduates each summer at the Biological Station.

Both the assistantships and scholarships are awarded on the basis of need, academic record, and recommendations.

Kitchen employment paying an amount equivalent to the cost of board and room for the entire session ($110) is available. Students interested in such employment, or in applying for assistantships or scholarships should write to the director. Early application is advisable.

Curriculum

The curriculum of the Biological Station includes 14 formal courses and seven research courses. Additional courses will be added. The botany courses now offered are: Principles of

Recreation

Plant Ecology, Taxonomy and Ecology of Freshwater Algae, Identification of Vascular Plants, and Ecology of Aquatic Plants; Investigations in Plant Sciences, and Research for the Master's Thesis and Research for the Doctor's Thesis are also offered. Staff members teaching botany include: Drs. George J. Goodman and Elroy L. Rice of the University of Oklahoma, and Mr. William C. Vinyard of Michigan State College.

Zoology courses offered are: Mammalogy, Herpetology, Natural History of Invertebrates, Natural History of Vertebrates, Field Entomology, Parasitology, Helminthology, Limnology, and Fishery Biology; also, Investigations in Zoology, Advanced Zoology, Research for the Master's Thesis, and Research for the Doctor's Thesis. Staff members teaching Zoology are: Drs. J. Teague Self, George M. Sutton, Harley P. Brown, Carl D. Riggs, and Charles C. Carpenter of the University of Oklahoma, Dr. Bryan P. Glass of Oklahoma A. and M. College; and Dr. George H. Bick of Tulane University.

Attendance at the Biological Station is a vital part of the education and training of all biology majors, and especially those who do graduate work. Students who have successfully completed two collegiate laboratory courses in biological sciences may apply for admission to the University of Oklahoma Biological Station. Attendance is restricted to those who apply in advance, and applications are considered on April 10. Those wishing further information should write to: Carl D. Riggs, Director, University of Oklahoma Biological Station, Norman, Oklahoma.

THE ROCKY MOUNTAIN BIOLOGICAL LABORATORY

By John C. Johnson, Director

The 28th annual six-weeks session of the Rocky Mountain Biological Laboratory in the Gunnison National Forest, Crested Butte, Colorado, is scheduled for July 1 through August 11, 1955.

Geology for Biologists will be given in 1955 for the first time, by Dr. A. N. Murray, head of Geology Department, University of Tulsa. This is a very unusual course and should be of special interest to all high school biology teachers, and to all graduate students of zoology and botany, who wish to have a broad understanding of geological principles and the succession of plant and animal life throughout the geological eras.

A *Genetics and Evolutionary Biology Department* will also be added in 1955, for graduate students, and for those wishing to do independent research in this rapidly developing field. This department will be under the supervision of Dr. Colin S. Pittendrigh, Princeton University; Dr. R. P. Levine, Harvard University; Dr. Charles L. Remington, Yale University, and Dr. Edward Novitski, University of Missouri.

The four regular courses will also be given. *Field Botany* will be under the direction of Dr. William A. Weber, University of Colorado; *Parasitology* by Col. George W. Hunter III, Chief, Medical Zoology Section, Fourth Army Area Medical Laboratory, Fort Sam Houston, Texas; *Mammalogy* probably by Dr. B. R. Coonfield, Brooklyn College, New York; and *Ecology*, the instructor still to be selected. This course emphasizes the ecological problems of the Rocky Mountain region.

Conservation Education is scheduled for the fourth time, to be given by the Director, Dr. John C. Johnson. This course considers the fundamental prin-

Site of Laboratory (altitude 9,500 ft.) at the foot of Gothic Mountain (12,646 ft.) showing some of the buildings.

ciples of all natural resources but with emphasis on the conservation of native animal and plant life of Colorado and the West. This course is particularly valuable for all high school biology teachers.

The Rocky Mountain Biological Laboratory is located in the central part of Western Colorado, in a beautiful mountain valley of the Gunnison National Forest, near Crested Butte, Colorado. The laboratory buildings are in the valley at an altitude of 9500 feet, with high mountains on all sides reaching up to nearly 14,000 feet.

Because of heavy snow and rainfall, the plant life is luxurious and the animal life abundant. Due to its isolation, and beautiful surroundings, this laboratory is an exceedingly fine place in summer for advanced biology students, and for research. Students can earn up to six semester hours of graduate, or undergraduate credit, during the six weeks session.

There is a good paved highway leading up to within eight miles of the Laboratory. In order to preserve the plant and animal life in its almost virgin condition, the last eight miles purposely have not been greatly improved. Students and independent research workers are delighted that this is so.

The total cost for the six weeks session is $225.00. This includes laboratory and research table fees, board, lodging, and microscope. The only additional cost is for individual textbooks, dissection and drawing equipment.

The newly elected officers for the current year are as follows:

President of Board of Trustees, Col. George W. Hunter III, Chief, Medical Zoology Section, Fourth Army area, Medical Laboratory, Ft. Sam Houston, Texas; Vice-President, Dr. H. G. Barclay, Head Botany Department, University of Tulsa; Secretary-Treasurer, Dr. J. Teague Self, Head, Zoology Department, University of Oklahoma; Director, Dr. John C. Johnson, Head, Biology Department, Pennsylvania State Tch. College.

The Board of Trustees, each of

whom serves for five years, now consists of the following: Col. George W. Hunter III; Dr. H. G. Barclay; Dr. A. O. Weese, University of Oklahoma; Dr. E. R. Hall, University of Kansas; Dr. J. Fisher Stanfield, Miani University; Dr. R. D. Manwell, Syracuse University; Dr. William H. Emig, University of Pittsburgh; Mr. Thomas K. Dissette, Cleveland, Ohio; Dr. Colin S. Pittendrigh, Princeton University; and Dr. John C. Johnson, Director.

Communications should be sent to the Director, Dr. John C. Johnson, 108 Meadville St., Edinboro, Pennsylvania. The 1955 bulletin will be ready in February.

NEW BOOKS

This section offers brief, mostly uncritical reports on the general content of recent publications in biological and related fields. Only the longer critical reviews will be signed. Each notice will be preceded, wherever possible, by the L.C. card number for the convenience of Librarians.

Acth And Cortisone, The Effect of, Upon Infection And Resistance, ed by H. Schwartzman; Columbia University Press, 2960 Broadway, New York 27, N. Y. 1953, 204 pp., ills., $5.50

This latest publication comes from the newly founded section on microbiology in the New York Academy of Medicine. It consists of 13 authoritative papers by a whole battery of collaborating authors, representative of several medical schools, research institutes, and some of the leading hospitals in the country.

Advances In Genetics, ed. by M. Demerec; Academic Press, Inc., 125 E. 23rd St., New York 10, N. Y. 1954, 488 pp., ill. $9.80

47-30313

This sixth volume in the series contains eight papers,— Map Construction in **Neurospora Crassa,** by Barratt, Newmeyer, Perkins and Garnjobst; Genetic Changes in Human Populations, by Bently Glass; Monozykotic Twins in Cattle, by Hancock; Genetics of Newer Human Blood Factors, by Levine; Comparative Incompatibility in Angiosperms and Fungi, by Lewis; Cytoplasmic Inheritance in Epilobium, by Michaelis; Genetics of **Colias,** by Remington; Artificial Insemination and Livestock Improvement, by Alan Robertson.

Amaryllis, by Peggie Schulz; M. Barrows and Company, Inc., 25 Fourth Ave., New York 16, N. Y. 1954, 128 pp., 12 ills., 3 in color $2.95

54-5376

Another "—And How to Grow Them" book by the author of the well-known manual on Gloxinia culture. Tells all about house and garden culture of these spectacular members of the lily tribe.

Amebiasis, by E. C. Faust; Charles C. Thomas, 301-327 E. Lawrence Ave., Springfield, Ill. 1954, 154 pp., 11 figs., $4.75

53-8643

As a professor of tropical disease and hygiene, the author is vitally interested in the control of this vicious disease. He discusses the nature and pathology of amebiasis, its manifestations and clinical evidences, diagnosis, treatment and prognosis, as well as its control from the public health and hygiene approach. It will have appeal for all southern medical people, but, in view of what happened during the Chicago World's Fair, it should not be unnoticed by northern physicians as well.

Animal Cytology And Evolution, by M. J. D. White; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 454 pp., 147 figs., $8.50

Since the first edition eight years ago so much has transpired in the field of animal cytology, and so many changes have affected cytological thinking, that a new and almost entirely rewritten version of the earlier work was in order. This is reflected too in the bibliography which has grown from 36 to 52 pages, despite the fact that many of the older citations were eliminated as out of date, or at least not pertinent.

Animal Tracks, intr. by Marlin Perkins; The Stackpole Co., Telegraph Press Bldg., Harrisburg, Pa. 1954, 64 pp., ills. & maps, $1.50

This paper-bound book deserves a better binding. It is delightfully illustrated, and the diagnostic spoor are accurately figured down to fractions of an inch. The thirteen types of big game are further embellished with maps and habit sketches.

American Forest Management, by Kenneth P. Davis; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954, 482 pp., tables. $7.50

53-8994

The author of this new work in the American Forestry Series is Professor of Forest Management in the School of Natural Resources at the University of Michigan. He has organized the text with the first part devoted to the forest as a productive entity. The second part treats of valuation principles and procedures.

Analysis of The Kinsey Reports, edited by D. P. Geddes. E. P. Dutton & Co., 300 Fourth Ave., New York 10, N. Y. 1954, 319 pp., $3.50

54-5055

Fifteen papers by as many authors from many walks of life here discuss the two reports from about as many different viewpoints.

Anatomy of The Migratory Locust, by F. O. Albrecht. John de Graff, 64 West 23rd St., New York 10, N. Y. 1953. 118 pp., 141 figs. $6.00

Entomologists and entomology teachers who are looking for a detailed and profusely illustrated manual on the dissection of the locust need look no further. The author who is a member of the Anti-Locust Research Center has gathered much of the scattered information about the internal and external parts of the locust into one volume.

Angler's Entomology, by J. R. Harris; Frederick A. Praeger, 105 West 40th St., New York 18, N. Y. 1954, 268 pp., 17 maps, 103 color photos, 24 black and white, 10 diag. $5.00

Definitely an out-of-the-ordinary kind of a book, call it what you will. It could be used as an entomology for fly-tieing anglers, but is also has sage advice for anglers who want to know more about entomology. The author is demonstrator in limnology in the department of zoology at Trinity College in Dublin. The book is one of a series which aims to interest readers in British wild life by capturing the inquiring spirit of the old naturalists.

Animal Control in Field, Farm And Forest, by W. Robert Eadie; The Macmillan Co., 60 Fith Ave., New York 11, N. Y. 1954, 257 pp. $3.75

Forty kinds of pestiferous animals, from bear and deer, all the way down through the dog and cat families to the rabbits and multitudinous rodents, are here given their come-uppance. The author is conservation minded in the broadest sense of the term. His approach is therefore not that of the total extirpationist. Each form is studied under four headings:— identification and habits, economic status, control and natural enemies.

Animal Courtship, by Maurice Burton; Frederick A. Praeger, 105 West 40th St.. New York 18, N. Y. 1954, 267 pp., ill. $4.00

54-6646

Probably the latest Kinsey Report on the animal world, this book comes from the facile pen of the Deputy Keeper of Zoology at the British Museum of Natural History. There are ten very excellent photographs of courtship displays and 49 drawings which compare favorably with the actual photography. The author is well known both in Europe and America for his broadcasts, lectures and articles on natural history.

by A. J. Cain; Longmans, Green & Co., 55 Fifth Ave., New York 3, N. Y. 1954, 190 pp., 5 figs., Textbook ed. $1.80, trade ed. $2.40

This book deals with the ideas of classification and evolution. In so doing it brings under scrutiny the kinds of animals, principles of classification, the species concept. genetic transformations, natural selection, the way species originate, interactions between species and evolution.

Animals of The Southwestern Deserts, by George Olin; Southwestern Monuments Association, Box 1562, Gila Pueblo, Globe, Arizona. 1954, 112 pp., 74 ills., $1.00

Devoted to the animal life of the lower Sonoran deserts, this book is the first of two which will do for the zoological aspects of the Southwest what the three previous did for the wildflowers. The next book, due the coming year, will be devoted to the animals of the higher elevations of the area. The whole series is designed to provide accurate and authentic information about the Southwest. It is succeeding in also providing interesting facts not generally known.

The Australian Way of Life, ed. by George Caiger; Columbia University Press, 2960 Broadway, New York 27, N. Y. 1953, 158 pp., 19 ills. $3.00

Originally published in England, this new addition to the "Way of Life Series" is the Australian response to the request of U.N.E.S.C.O. It consists of seven separate essays on the nation as a whole, the family, education, politics, economic institutions, religious instructions and world relations as Australians look at and participate in them. A very sensible innovation is the brief biography of each contributor which follows his offering.

Autotrophic Micro-organisms, ed by B. A. Fry and J. L. Peel; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 305 pp., ills. $5.00

Since all heterotrophic organisms are ultimately dependent upon the autotrophic for much of preformed organic matter and energy, the study of the simpler forms which obtain their carbon and nitrogen for growth from inorganic sources and their energy from light or inorganic oxidation reactions, becomes of increasing importance. The thirteen papers in this symposium are devoted to the autotrophic way of life and deal authoritatively with the classification, biology, biochemistry and economic importance of the autotrophs. It is a "must" book for the graduate library.

— B —

Bacterial Physiology, Introduction to, by E. L. Oginsky & W. W. Umbreit; W. H. Freeman & Co., San Francisco, Cal. 1954, 416 figs., 6 drawings, 18 tables, text $6.00, trade $7.25

54-5873

The tremendous increase in the number of workers in the field of bacterial physiology in the last decade has not only focussed attention on this most fundamental phase of the science, but has also necessitated the summarizing and coorelating their discoveries within the covers of one textbook. The authors are both former teachers of bacteriology who are now associated at the Merck Institute for Therapeutic Research.

Fundamental Principles of Bacteriology, by A. J. Salle; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954, 782 pp., 269 figs., $8.50

Laboratory Manual on Fundamental Principles of Bacteriology, by A. J. Salle; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954, 176 pp., 4 figs., $3.50

53-11484

Brought up to date by the addition of the latest materials and techniques, these well-known beginners texts are here presented in their fourth edition. They aim to cover the whole field of beginning bacteriology. There is a chapter on the bacterial diseases of man, but medical bacteriology is conspicuous in both volumes by its absence. For the liberal arts and science course in bacteriology, where the accent is definitely non-professional, this set of books would appear to be worth investigating.

Beetles of The Pacific Northwest, by Melville H. Hatch, Part I; University of Washington Press, Seattle 5, Wash. 1953, 340 pp., 37 pl., $5.00

A53-9444

Dr. Melville Hatch, former Vice-President of Phi Sigma, here presents over 660 species of the beetles found in British Columbia, Washington, Oregon and Idaho. There is a 32-page introduction, the rest of the book is devoted to the Adephaga. Dr. Hatch hopes to complete this worthwhile and ambitious work. If he succeeds in his ambitions, he will have accomplished much for the entomological sciences in particular and for the whole of science in general. There is no more recent guide to the beetle fauna of the Northwest than 1916.

Biochemistry of Genetics, by J. B. S. Haldane; Macmillan Co., 60 5th Ave., New York 11, N. Y. 1954, 144 pp., 7 figs. $2.75

This is supposed to be the only book of its kind in existence. Its chapters deal with possible primary products of gene action; genes controlling synthesis in fungi; biochemical genetics in yeasts, bacteria and viruses; of higher plants, of higher animals; of man; and extranuclear influences, as well as mutation, and the problem of gene reproduction.

Basic Botany, by Fred W. Emerson; The Blakiston Company, 576 Madison Ave., New York 22, N. Y. 1954, 425 pp., ills. $5.00

54-6584

This is the second edition of a popular textbook which first appeared in 1947. The framework of the earlier edition has been kept, but much of the additional data covering has been slanted towards farm and garden, with the following as typical: growth regulators, vitamins, micro-nutrients, enzymes and soil-water-nutrients relationships.

Biology, Teach Yourself, by M. E. Phillips and L. E. Cox, Roy Publishers, 25 West 45th St., New York 19, N. Y. 1954, 221 pp., 78 figs., $2.50

54-5221

This is one of a new "Teach Yourself" texts, of which the anatomy, astronomy, chemistry, physics and physiology volumes have been issued. The botany issue is in preparation. In this country where nobody teaches himself anything its chief use will probably be as a review manual.

Biology, Exploring, by Ella Thea Smith: Harcourt Brace & Co., 383 Madison Ave., New York 17, N. Y. 1954, 579 pp., 351 ills. $3.09 net

When this book first came out we gave it a favorable notice. It is good to see that our judgment has been justified in this fourth edition, all of the predecessors having come out since 1938. Brought up-to-date, this book is advanced enough to be used in some elementary college courses, although it is only intended for high-school use. Has 30 units in 10 chapters.

Biology in Daily Life, by Francis D. Curtis and John Urban; Ginn and Company, Statler Building, Boston 17, Mass. 1954, 608 pp., ills. $4.08

This is another high school text, made up in eight units with 20 chapters in all. For those who prefer to emphasize the more sociological aspects of biology and conservation, this book should prove interesting. Students trained with it would still have unexplored avenues when they enter college.

Biology of Man, by John S. Hensill; The Blakiston Division, 330 W. 42nd St. New York 36, N. Y. 1954, 440 pp., ills. $5.50

54-10742

An outgrowth of the program of General Education at San Francisco State College, this book will have a specialized appeal. Of generalized biological ideas and concepts, of the various plants and animals, it is quite emancipated. For those who wish to offer courses on human biology and/or health, it should have an appeal.

Biomathematics, by Cedric A. B. Smith; Hafner Publishing Co., 31 East 10th St., New York 3, N. Y. 1954, 727 pp., ills. $13.50

This is the third edition of the original book on the same subject by the late W. M. Feldman, M.D., which has been completely rewritten by Dr. Smith. It follows in the great tradition of Sir Francis Galton, Karl Pearson, J. B. S. Haldane, Sewall Wright and Sir Ronald Fisher. Its objective is to present the fundamentals of mathematics to the biological student, the medic and the research worker. Although it is not a text in statistics, two chapters on that subject have been included. The book loses nothing by the introduction of certain fictional characters and examples, like Herlock Soames, Prof. Moronami, the Ngboglus, and the universities of Camburgh and Edinford. That the author has tried to give a specially careful explanation of subjects for which he does not know of any adequate or easily accessible account elsewhere, and that this has given some of these a prominence they might not otherwise deserve is all to the good. Those who can afford this book are sure to get their money's worth.

Birds of Britain and Europe, A Field Guide to, by R. T. Peterson, Guy Mountfort and P. A. D. Hollom; Houghton Mifflin Co., 2 Park St., Boston. 1954, 318 pp., 1107 ills., 367 maps. $5.00

A dedication to "Our Long-Suffering Wives," and Shakespeare's quotation from the "Merry Wives of Windsor:" — "She laments, sir, her husband goes this morning a-birding,' start this new volume off on an interesting level. It is another volume in the Peterson Field Guide Series, to be published in at least six countries and in five or more European languages. Those who are in areas where European strays are likely to show up will want to have it. Some 551 species are described. Julian Huxley has given an all-out enthusiastic welcome to it in an interesting preface.

Botany, College, by Harry J. Fuller and Oswald Tippo; Henry Holt and Co., 383 Madison Ave., New York 17, N. Y. 1954, 993 pp., ill. $6.90

54-6603

The success of the first edition of the, by now, well-known "Fuller and Tippo Botany," prompted this newly revised edition in a short five-year period. The revisions are so slight, however, that schools which are using the old edition will have no apparent difficulty in using both simultaneously. One of the helpful adjuncts of both editions is the 26-page glossary of terms used in the text.

— C —

Carotenoids, Their Comparative Biochemistry, by T. W. Goodwin. The Chemical Publishing Co., 212 Fifth Ave., New York 10, N. Y. 1954, 356 pp., 48 tables, 33 figs. $7.00

This is the first American edition of a valuable British work which left the author's hands in 1951. If it were only for the 10-page first appendix on the carotene content of some 350 plants either in green tissues or in fruits, seeds and tubers, this book would be invaluable. The second appendix furnishes comparative data on the carotene values of well-known plants from Honduras, Guatemala, El Salvador, Nicaragua and Panama, Mexico and Costa Rica. In the body of the text the biochemical side of the distribution, biogenesis and function of carotenoids in plants **and** animals are compiled and evaluated. Carotenoids found in the algae, fungi and bacteria are compared with those in the higher plants. The conversion of carotenoids into vitamin A is discussed.

Cell Chemistry, edited by Dean Burk; Elsevir Publishing Co., 402 Lovett Blvd., Houston 6, Texas. 1954, 362 pp., ill., figs. $7.50

53-7253

This is a "fest-schrift" in commemoration of fifty years of biochemical discoveries by Dr. Otto Warburg, head of the Kaiser Wilhelm Institute for Cell Physiology at Berlin-Dahlem which was reopened by General Maxwell D. Taylor, on 8 May 1950. There are thirty-six papers covering too wide a range of biochemical research to be separately commented upon here. Each paper is accompanied by an abstract in the other languages than that in which it is written. The papers are divided between English, German and French, with two of the last, five or six in German, and most in English.

Chemistry, Fundamentals of, by L. Jean Bogert; W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa. 1953, 648 pp., 168 figs., $4.50

52-11361

This new seventh edition of a justly highly esteemed text has so much to commend it as a reference work for general biologists that it must be seen to be appreciated. The author's experience as a teacher in medical schools probably accounts for the unusual emphasis on the biochemical side. Chapter 18 on Radioactivity, Nuclear Reactions and Atomic Energy is a 20-page model for clarity and inclusiveness.

Chemistry, Fundamentals of Inorganic, Organic and Biological, by Joseph I. Routh; W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa. 1954, 418 pp., 106 figs.

54-6095

The professor of biochemistry at the State University of Iowa is author of this manual which now appears in its third edition. It may be a matter of conjecture whether one could present the fundamentals of inorganic, organic and biological chemistry in the small compass of 418 pages. However, nursing schools and those offering medical technology courses may find it useful. For them, it has preserved the interesting and informative high spots and left the more difficult ones unaccepted. This is the sort of a scientific text even a layman could understand and enjoy.

Cytology, General, by De Robertis, Nowinski and Saez; W. B. Saunders Co., 218 W. Washington St., Philadelphia 5, Pa. 1954, 456 pp., 162 figs., $7.75

54-6094

Intended primarily for students of medicine ,agronomy, veterinary science, and the other biological and natural sciences, this revised edition of the 1948 original is the result of all the changes that have gone on in cytology since that date. The book continues to stress the morphological, physiological and genetic aspects of modern cytology.

Cytology, International Review of, ed. by G. H. Bourne and J. F. Danielli; Academic Press, 125 East 23rd St.,

New York 10, N.Y. 1954, 530 pp., ill. $9.50
52-5203

This is Volume III of the review prepared under the auspices of the International Society for Cell Biology. The thirteen papers presented in it have as their authors: Max Alfert, G. Asboe-Hansen, R. A. Beatty, J. Berthet, Sven-Olof Brattgard, Otto Bucher, Ivor Cornman, Chr. De Duve, E. W. Dempsel, A. L. Dounce, Tryggve Gustafson, Holger Hyden, Albert I. Lansing, A. G. Everson-Pease, Charity Waymouth and Roy G. Williams.

— D —

Dermatology, Handbook of Tropical, ed. by R. D. G. Ph. Simons; The Elsevier Press, 402 Lovett Blvd., Houston 6, Texas. 1954, 1705 pp., 1098 ills. $15.00

This is the second and completing volume of the original work. Fifty-eight of the eighty contributors appear with authoritative articles in this volume, which includes papers No. 34 through to No. 102. Diseases due to animal parasites, to fungi, to allergy, malnutrition and metabolic disturbances, as well as tumours, are the main subjects presented.

Doctoral Dissertation Accepted by American Universities 1952-1953; Vol. 20, by Arnold Trotier and Marian Harman; The H. W. Wilson Co., 950-972 University Ave., New York 52, N. Y. 1953, 305 pp., $6.00
34-40898

During the year 1952-53 there were 2338 doctorates conferred for theses in the biological sciences, i.e. agriculture, anatomy, bacteriology and microbiology, biochemistry, botany, entomology, genetics, horticulture, medicine and surgery, pharmacology, physiology, psychology, public health, and zoology. While every graduate dean's office probably has a complete set of these publications, they would be invaluable in the office of the head of any of these listed departments, if only to act as a check on the not infrequent tragedy of a graduate student following a cold trail because only 43 of the 119 institutions reporting require printing of the doctoral dissertations.

— E —

Ecology, Elements of, by George L. Clarke; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1954, 534 pp., ills., $7.50
54-12205

The author's association with Harvard, the Marine Biological Laboratory, the Woods Hole Oceanographic Institution, and the U. S. Fish and Wildlife Service, all place him in an authoritative position as an ecologist. His book is well written, and surprisingly free from the complex terminology of some of its contemporaries. Land and aquatic plants and animals are all treated as parts of units, not like the "never the twain shall meet" treatment hitherto accorded them by not a few overspecialized ecologists.

Ecology, Principles of General, by Angus M. Woodbury; The Blakiston Co., 575 Madison Ave., New York 22, N. Y. 1954, 503 pp., 167 figs. $6.00
54-6585

It is something of a surprise to discover a textbook on ecology which somehow has managed to circumvent the use of the trade-jargon which used to characterize the older manuals. **Biome** is here, and **biocenose,** but somewhere in the migration of the terminological caravan westward a number of verbal offspring seem to have been scalped and buried by the way. We doubt if anyone will seriously miss **Ecad**, **Ece** and **Ecesis.** In addition to its very wide, one might say "catholic" (with a small 'c') integration of physical and biological facts, this book **is interesting,** just as interesting as the one just summarized. Since that one emanated from Harvard and this from Utah, the two should complement each other rather effectively.

Energetics of Development, by Lester and Lucena Barth; Columbia University Press, 2960 Broadway, New York 27, N. Y. 1954, 117 pp., 29 tables, 17 figs., $3.00
54-6712

Published by the Trustees and Directors as one of the samples of current free scholarship, this work attempts to supplement, complement and complete the earlier production by Thomas Hunt Morgan of the same Columbia faculty. This work is written in a conversational style which, while making the reader a partner in the problem, never descends to the merely chatty. It is divided into four main sections devoted to the storage of energy, the release of energy, the localization of that release, and protein metabolism.

Enzymes, Introduction to The Chemistry of, by Keith J. Laidler; McGraw Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954, 208 pp., $5.00
53-11479

This new work by the author of "Chemical Kinetics" in the International Chemical Series, does not assume that the reader has a detailed knowledge of either organic chemistry or biochemistry. It is intended for those who wish to learn something of the more important enzymes and the mechanism of their action, and for the physical chemist who is interested in applying his own techniques to the detailed nature of enzyme reactions.

Evergreens, by L. L. Kumlien; Rinehart and Co., 232 Madison Ave., New York 16, N. Y. 1954, 91 pp., 147 figs.
54-5327

Fully illustrated information and directions for the selection, planting, and care of evergreens, also use for special effects, with suggested combinations.

— F —

Fishing, Fresh Water, by Arthur H. Cahart; Dell Publishing Co., 261 Fifth Ave., New York 16, N. Y. 1949, 320 pp., ills. $0.35

Any good book stall should be able to supply this handy little volume. The author is an angler of repute residing in Denver. His style and matter are well calculated to meet the interests or the needs of those who would get their "lure into the water."

Fishing, Salt Water, by Larry Koller; The Bobbs-Merrill Co., 724 N. Meridian St., Indianapolis 7. Ind. 1954, 144 pp., 294 ills. diagrs., $2.75

This is a fascinating account of modern surf, dock, and boat fishing for salt water forms. Those who enjoy this sort of relaxation and sport will also enjoy this book. Those who are still unbitten by the surf-caster's urge may run into the danger of infection by reading it.

Forestry, by H. G. Champion; Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 1954, 230 pp., $1.00

This new item in the Home University Library of Modern Knowledge emanates from the Professor of Forestry in the University of Oxford. The treatise is general in appeal with technical details kept to a minimum.

Gardening With Nature, by Leonard Wickenden; The Devin-Adair Co., 23 East 26th St., New York 10, N. Y. 1954, 392 pp., ills. $4.95

54-9301

Subtitled "How to Grow Your Own Vegetables, Fruits and Flowers by Natural Methods," and introduced by Paul B. Sears at his witty best, this latest addition to the organicist literature in the conflict with the chemical fertilizer faction, come from the pen of a Fellow of the American Institute of Chemists.

Popular Gardening Ideas, ed. by Thomas Everest; Arco Publishing Co., 480 Lexington Ave., New York 17, N. Y. 1954, 144 pp., 249 photos, ills., $2.00

This is a collection of 55 articles on almost all phases of gardening edited by the horticulturist of the Bronx Botanical Gardens. Where photographs would not apply, e.g. in the steps in grafting, bulb planting, pruning, etc., there are very clear diagrammatic sketches.

Goiter,Endemic, by Stanbury, Brownell, Riggs, Perinetti, Itoiz, Del Castillo; Harvard University Press, Cambridge. Mass. 1954, 209 pp., 53 figs., 17 tables, $4.00

54-7064

Claiming to be the first complete account as disclosed by newer methods of thyroid study, this book is based on the Mendoza Epidemic in Argentina and the joint efforts of responsible authorities of the Harvard Medical School, the Massachusetts General Hospital, the departments of medicine biochemistry and surgery of the University of Cuyo, and the Central Hospital at Mendoza. After detailing the situation in the introduction, the book discusses functional interrelations in chapters four to seven. The last five chapters are devoted to the dynamics of iodine metabolism.

Grasses, Diseases of British, by Kathleen Sampson and J. H. Western; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 118 pp., 19 figs., 9 plates, 2 tables, $3.00

The advances in plant pathology since this work originally appeared in 1941 necessitated a rather complete revision to bring it up-to-date. The revision is not confined to purely British developments, those of foreign lands are included.

Herring Gull's World, by Niko Tinbergen; Frederick A. Praeger, 105 West 40th St., New York 18, N. Y. 1954, 255 pp., 30 pl., 58 figs., $4.00

This is a rather complete and careful study of the social behavior of the herring gull. Dr. Tinbergen has reorganized the animal behavior research at Oxford along the line of that at prewar Leiden. The book is interestingly written, even entertainingly, which is apparently part and parcel of the Tinbergen approach.

— H —

Histology, ed. by Roy O. Greep; The Blakiston Division, 330 W. 42nd St., New York 36, N. Y. 1954, 953 pp., 648 figs., $15.00

53-11570

All the twelve contributing authors who have joined Dr. Greep in this work are present or former members of the Harvard Medical School Staff. They set out to revise the fifth edition of the old Bremer & Weatherford manual, but by the time they finished it was an entirely new textbook. Aside from the positions of responsibility held by the associated authors, their textbook has some of the freshest and most original illustrations to appear in recent years.

Histopathologic Technic and Practical Histochemistry, by R. D. Lillie; The Blakiston Division, 330 W. 42nd St., New York 36, N. Y. 1954, 501 pp., 30 tables, $7.50

53-5622

This is a revised and retitled version of the author's 1947 "Histopathologic Technique." Since it appeared there has been so much active work done in histochemistry that the author felt it necessary to introduce them into his work. As a result this new work is practically a desk and laboratory manual of histological techniques.

Hydrobiological Laboratories and Personnel in North America, by Robert W. Hiatt; University of Hawaii Press, Honolulu 14, Hawaii. 1954, 324 pp., 22 ills., $3.75

54-7834

Prepared under the editorship of Dr. Hiatt, assisted by Drs. Hasler of Wisconsin, Hubbs of Scripps, Merriman of Yale, Ricker of the Canadian Fisheries Board, and Taylor of Michigan, this desirable volume gives most of the information anyone interested would want to have about the 187 fresh and salt-water educational and research institutions in North America from Point Barrow, Alaska all the way down to Barro-Colorado Island in Gatun Lake, Canal Zone. We in the educational world have long needed this directory.

— I —

Insect Fact and Folklore, by Lucy W. Clausen; Macmillan Co., 60 5th Ave., New York 11, N. Y. 1954, 194 pp., 30 figs. $3.50

Anyone interested in the oddities of human superstition, fancy and sober truth will find all three entertainingly served up in this modern potpourri. The author has been President of the New York Entomological Society and is at present lecturer in the Columbia University School of Pharmacy.

Intertidal Invertebrates of The Central California Coast, by Sol Ligtt, revised; University of California Press, Berkeley 4, California. 1954, 446 pp., 138 figs., $5.00

Revised by Ralph I. Smith, Frank A. Pitelka, Frances M. Weesner of the University of California Zoology Department, and Donald P. Abbott of Stanford University Zoology Staff, this is the latest edition of Dr. Light's original work. It includes the hemichordata, chordata, intertidal fishes, marine algae and floral plants, as well as the field studies and the 39 page of invaluable bibliography.

Isotopic Tracers, by G. E. Francis, W. Mulligan and A. Wormall; John De Graff, 64 West 23rd St., New York 10, N. Y. 1954, 306 pp., 51 figs., 15 appendices, $7.00

This is a book of theory and practise. The first part is a rapid but clear runthru of isotopes as tracers, their preparation, properties, measurement, autoradiography, hazards and precautions and some examples of their use. The practical part includes six different techniques with seven additional or alternative experiments. There are fifteen helpful appendices.

— L —

Life In Lakes And Rivers, by T. T. Macan and E. B. Worthington; Frederick A. Praeger, 105 West 40th St., New York 18, N. Y. 1954, 272 pp., 68 photos, 45 in color, 20 maps and diagr., $4.50

Anyone who has flown over England cannot forget the vivid green of its hillsides, its lakes and the surprising amount of forest land. This book gives additional evidence of the wealth of British lakes and waters. The use of colored photographs such as these is a gorgeous distraction but invitation to investigate further. This is live Ecology.

Meats, Microbiology of. by Lloyd B. Jensen; Garrard Press, 119-123 West Park Ave., Champaign, Ill. 1954, 422 pp., tables, etc.

From the research laboratories of Swift & Company of Chicago comes this authoritative third edition on an important phase of meat technology. Part of its inspiration came out of the Army Medical Service School at the Chicago Quartermaster Depot, part of it out of the U. S. Federal Meat Inspection Service, and Bureau of Animal Industry.

Microbes And You, by Stanley E. Wedberg; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954, 439 pp., 75 figs., 3 pl., $4.50

This little book is intended for those students who have had no previous experience in science. It is, therefore, more of a cultural course, written to keep the studnt interested. It apparently has no laboratory work to accompany it.

Microbiology, Textbook of, by William Burrows; W. B. Saunders Co., West Washington Square, Philadelphia 5, Pa. 1954, 824 pp., 266 ills., $11.00
54-6090

This is the old Jordan text of as far back as 1912, now in its 16th edition. It has been expanded to include a rewriting of the pathogenesis of whooping cough, sections on chemotherapy have been added to the chapters on bacteria, drug resistance has been expanded, microbial variation has been expanded, chemotherapeutic agents have been consolidated in the treatment of other antibacterial agents. There is hardly a page in the last edition that has not been rewritten in this new one.

Microtomist's Formulary and Guide, by Peter Gray; The Blakiston Division, 330 W. 42nd St., New York 36, N. Y. 1954, 794 pp., 87 figs., $10.50
53-11567

This is the first comprehensive book of formulae for microtechnicians that has appeared in the U. S. A. in some years. The old Lee's "Vade Mecum" in its different editions and under different editors served the purpose for quite a long time. From a careful inspection of its offerings one is inclined to think that this volume will soon be seen on the reference shelf of most laboratories.

Molecular Biology, Kinetic Basis of, by Frank H. Johnson, Henry Eyring and Milton J. Polissar; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1954, 874 pp., figs. $15.00
54-7856

"Although there have been many publications dealing with biological reactions from a physical chemical point of view, the present approach has the advantage of incorporating a relatively new understanding of the mechanisms governing rate processes in general. This new understanding is largely the outgrowth of modern research in quantum and statistical mechanics. It rests heavily upon the notion that reactants are in equilibrium with an activated complex, and puts at our disposal the theoretical methods useful for equilibria." (Quoted from the introduction.)

Mumps, Measles & Mosaics, by Kenneth M. Smith and Roy Markham; Frederick A. Praeger, 105 West 40th St., New York 18, N. Y. 1954, 160 pp., 21 photos, 4 in color, 10 figs., $4.00

This is a study of plant and animal viruses, in the New Naturalist Library, a British undertaking, designed to popularize scientific ideas and reawaken the old-fashioned appreciation of natural history which was the predecessor of much of the popular interest in science of Darwin's time. This book on the viruses has a number of unusual photographs of virus-organisms taken with the electron microscope.

Mycology, Manual of Clinical, by Conant, Smith, Baker, Callaway and Martin; W. B. Saunders Co., 218 W. Washton Sq., Philadelphia 5, Pa. 1954, 456 pp., 202 figs. $6.50

54-5319

This is the second edition of the original 1954 textbook on fungus infections. It has been brought up-to-date with the advances that have been made in the use of potent antibiotics in the treatment of acute bacterial diseases. Most of the authors are, or have been connected with the Duke University School of Medicine.

— N —

Nature and The Greeks, by Edwin Schrodinger; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 97 pp., $2.00

The theme of this new work by the Senior Professor at the Dublin Institute for Advanced Studies is a synthesis of facts and theories, much as was the theme of the author's previous "Science and Humanism." This was also true of the earlier "What is Life?" in regard to which the author said: "We have inherited from our forefathers the keen longing for unified, all-embracing knowledge . . . but on the other hand, it has become next to impossible for a single mind to command more than a small specialized portion of it. I can see no other escape from this dilemma . . . than that some of us should venture to embark on a synthesis of facts and theories, albeit with second-hand and incomplete knowledge of some of them — and at the risk of making fools of ourselves."

— P —

Paramecium Aurelia, The Genetics of, by G. H. Beale; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 179 pp., 11 figs., 21 tables, $2.50

A summary of experimental work on the genetics of **Paromecium,** heavily accenting the most recent. Role of extra-chromosomal determinants versus genes is emphasized.

Physical Education, Corrective, by Josephine L. Rathbone; W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa. 1954, 318 pp., 35 figs., diags.

54-7690

This is the fifth edition of a textbook by one of the Columbia University Teachers' College Staff which first appeared 20 years ago. Its continued existence and use speaks well for the author's ability to keep this highly volatile subject up-to-date.

Physiology, Outline of Developmental, by C. P. Raven; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954, 224 pp., 64 figs., $5.50

In this volume the distinguished professor of zoology in the University of Utrecht effectively bridges the descriptive and the experimental fields of embryology. It deals with the causal factors in development, considering step by step the processes which determine the development of an organism from the fertilized ovum to the adult.

Physiology, Human, by W. B. Youmans; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954, 481 pp., 219 figs., $6.00

Since this text is designed to be used by students with no background knowledge of physics or chemistry, the first fifty pages are devoted to that purpose. Those who have had basic biology and chemistry courses can start right off with muscle, nerve and reflex action. The book is designed for laboratory exercises which could accompany it.

Physiology of Insect Metamorphosis, by V. B. Wigglesworth; Cambridge University Press, 32 East 57th Street, New York 22, N. Y. 1954, 152 pp., 45 figs., $2.50

The author of this work is the same research worker who discovered the function of the "corpus allatum" in producing the juvenile hormone which keeps larvae in larval character. He also discovered the neurosecretory cells in the brain that are the source of another growth hormone.

Physiological Chemistry, Laboratory Experiments in, by A. K. Anderson and G. H. Pritham; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1954, 179 pp., $2.90

One hundred and twenty-one experiments to accompany the senior author's textbook. The first edition appeared in 1936. For those who desire to include quantitative experiments certain of those listed are starred. Unstarred experiments could be finished in one semester of 4 hours laboratory work a week.

Plant Breeding for Everyone, by John Y. Beaty; Charles T. Branford Co., 551 Boylston St., Boston 16, Mass. 1954, 102 pp., 16 ills., diags., $2.75

53-7212

A former associate of Luther Burbank here tells in a very interesting way how new varieties of plants come into being, genetically, or by sports, and how they should be looked for, and how best to market them if they prove worthwhile.

Plant Life in Malaya, by R. E. Holttum; Longmans Green & Co., 55 Fifth Ave. New York 3, N. Y. 1954, 254 pp., 51 figs., 1 pl., $3.00

The author, who is a Cambridge man, wrote this book for those who live in Malaya, or who might expect to travel or teach there. It has, therefore, the fascination of a forbidden peek into a region which may become much more important in the eyes of the world and its news as time goes on.

Plant Regulators in Agriculture, ed. by H. B. Tukey, John Wiley & Sons, 440 4th Ave., New York 16, N. Y. 1954, 269 pp., figs., & tables, $5.50

54-9457

Headed by the chairman of Michigan State's Horticulture Department, the 16 collaborating authors have attempted to clear up the uncertainties and emphasize the importance of the use of plant regulators. They strive at an understanding of basic principles which can be modified to fit local situations and changes in environment. Everyone from farmer and county agent to professor and researcher will find it helpful.

Proceedings of The Seventh International Botanical Congress, ed. by H. Osvald & E. Aberg; Chronica Botanica Co., 977 Main St., Waltham, Mass. 1954, 899 pp., 20 pl., $17.35

This is the final and official record of the 1950 meetings in Stockholm which were attended by more than 1,500 botanists from 54 countries. Everyone interested in plant sciences will find in this volume fascinating and stimulating results of modern research in practically every field of botany.

Protein Metabolism, by R. B. Fisher; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1954, 198 pp., 24 figs., 15 tables, $2.50

This is one of the latest in the well-known Methuen series, and the author is demonstrator in biochemistry at the University of Oxford. The seven chapters are entitled respectively: digestion and absorption of proteins; the overall picture of protein metabolism; deamination; transamination and urea synthesis; metabolism of the amino-acids; use of isotopes in the study; metabolic and endocrine interactions in protein metabolism; and the nutritive value of proteins.

— R —

Radiation Biology, edited by Alexander Hollaender, Vol. 1, parts 1 & 2 (not sold separately). McGraw-Hill Book Co., 330 West 42nd St., New York 36. N. Y. 1954, 1265 pp., figs., diagrs., $17.50

53-6042

The three volumes in this series deal with the biological effects of radiations, corpuscular and electromagnetic, throughout the energy spectrum from the highest available energies to the near-infrared region. The Editor is Director of the Biology Division, Oak Ridge National Laboratory. He has had the cooperation of Austin M. Brues, Berwind P. Kaufmann, Herman J. Muller and Lauriston S. Taylor. The two volumes which comprise parts one and two of volume one have been bound separately, probably to avoid making too cumberson a book of 1265 pages. The reference index alone takes twenty-six pages, while the subject index runs through thirty-six. Twenty-one authors have contributed the eighteen chapters which make up Volume One. Volume two is in preparation.

Radiocarbon Dating. by Willard F. Libby; University of Chicago Press, 5750 Ellis Ave., Chicago 37. Ill. 1952, 124 pp., 11 figs., 7 tables, $3.50

Radiocarbon Dating. ed. by Frederick Johnson; Society for American Anthropology, c/o Richard B. Woodbury. Dept. of Anthropology, Columbia University. New York 27, N. Y. 1951, 65 pp., $1.50

While the Libby paper is in reality slightly later in point of publication, we have given it priority on this list because Frederick Johnson, the Editor of the Supplement by the same title to the July 1951 issue of **American Antiquity,** Vol. XVII, No. 1, Part 2, in the second paragraph, mentions Willard Libby's advocacy of this method of dating otherwise undated materials as far back as 1933. Dr. Libby's book includes a chapter by Dr. Johnson. The Supplement to **American Antiquity** consists of twelve papers by seventeen collaborators. A careful perusal of both publications will bring the reader up-to-date at least on the backgrounds of this fascinating and historically important development, in which the build-up of carbon 14 through the passage of time is measured and the age of the matter being investigated is determined.

Representative Chordates, by Charles K. Weichert; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954, 204 pp., figs., $3.50

53-12875

Dr. Weichert's large opus, "The Anatomy of Chordates" contains 861 pages. This formidable reference volume was reduced to 451 pages in his "Elements of Chordate Anatomy." Now he has still further compacted his material in this slim 204 page volume. Despite its brevity, since it is designed for one-semester courses, it contains complete directions for dissecting the forms included, bold-facing each new term when it first appears, organ function and natural history of each form, and a material improvement of illustrations used.

Rose, History of The; by Roy E. Shepherd; Macmillan Co., 60 Fifth Ave., New oYrk 11, N. Y. 1954, 264 pp., 26 ills., 1 chart, $4.75

It took an artist-sculptor turned horticulturist to produce the first complete history of the rose. Most of this work is sober horticultural history, with little of the legend or the typical romance about the rose.

— S —

Science And Civilization in China, by Joseph Needham; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 318 pp., 13 pl., 9 tables, 2 maps, $10.00

This is Volume I, devoted to the introductory orientations which will be fundamental to the six promised volumes which are to follow. It is a large undertaking, one that will be a distinct contribution to modern history of science, as well as to a better understanding of Chinese backgrounds. The fact that there are 45 two-columned pages of references alone for this introductory volume makes one realize what a contribution the collection and interpretation of all this material will be to future students. That Dr. Needham will be the interpreter is added gold. This will be a set of books that no self-respecting college library can afford to ignore.

Science For Today. by V. C. Smith and B. B. Vance; J. B. Lippincott Co., 227-231 So. 6th St., Philadelphia 5, Pa. 1954, 737 pp., ills., $3.80

53-10101

First published in 1946, this third edition of an eighth or ninth grade textbook should make interesting reading for the average layman who wants to get an organized view of what it is all about. The units are offered under six headings, matter, energy, life, earth, man and inventions. Visual aids, study tests, laboratory experiments, review matching exercises, thought questions, and bibliographies are all provided.

Science of Man, by Mischa Titiev; Henry Holt and Company, 383 Madison Ave., New York 17, N. Y. 1954, 489 pp., 131 figs., $7.00

54-6622

The book-jacket gives three sections into which this book is divided:— the first deals with man as part of the animal world, the second with the march of culture, the third with the conflict between cultural and biological sets of rules. As far as this reader can see the author's argument, it would appear that cultural rules get, or should get, the worst of it. The author apparently feels there is a need for additional universal laws of social science applicable to the understanding of social groups throughout the world. "In times of crisis, when the threat of social disintegration looms large, Americans increase the demands for effective patriotism by calling for more and more tokens of loyalty, through enforced oaths, investigations, exclusion of foreigners, and pledges of allegiance." (p. 452). This is the concluding sentence in the sub-chapter on "American Science, Religion and Patriotism," which begins: "Every student of modern American culture is struck by the lack of reliance on religion." There is a curious lack of reliance on scientific fact in the book, if we may judge by the author's soft-pedalling the Piltdown Man exposures by using terms like "supposedly" and "controversial" but still picturing the reconstructions as if there might be some value in them. For a professor in a great midwestern university this looks a bit like special pleading. This book should be popular in the USSR, as well as in the USA.

Scientific Thought, Main Currents of, by Stephen S. Mason; Henry Schiman, 20 East 70th St., New York 21, N. Y. 1953, 520 pp., $6.00

This is the first major work of one of the younger science historians. Graduated from Oxford in 1944 with a major in chemistry, he conducted research on the chemistry of anti-malarial drugs, but studied the history of science in his spare time. Up to last pear he was lecturer in the subject at the Old Ashmolean Museum. His conclusions on science and history would seem to be in marked disagreement with the author just reviewed. "The influence of the scientific method upon the men who espouse it, for the most part, has been small. Scientists generally have adopted the values of the society to which they have belonged, even in the cases where those values have been detrimental to the advance of science, as in Germany under the Third Reich." (p. 491).

Silviculture, The Practise of, by Ralph Hawley and David Smith; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1954, 525 pp., 112 figs., 12 tables, $7.50

54-11668

This is the sixth edition of a text which first appeared in 1921 and has been acquiring friends and users ever since. It is practical, and each technique is not only explained but the background reasons are given, with limitations carefully defined. The use of silvicides is for the first time explained. Photographs also make their appearance for the first time in this really thoroughly revised text by members of the Yale University staff.

Statistics And Mathematics in Biology, ed. by Oscar Kempthorne; Iowa State College Press, Press Building, Ames, Iowa. 1954, 632 pp., tables, etc., $6.75

54-9376

Assistant editors Theodore A. Bancroft, John W. Gowen and Jay L. Lush, have compiled a manual out of 44 separate contributions which range from all over the United States, and even some foreign countries. Its five main divisions are: general biometrical principles and procedures; changes in population number; estimation of population; determination of biological response, and genetical analysis of populations.

Storage of Cereal Grains And Their Products, ed. by J. A. Anderson and A. W. Alcock; American Association of Cereal Chemists, University Farm, St. Paul 1, Minn. 1954, 515 pp., 90 ills., 52 tables, $11.00

The eleven contributed articles in this second volume of the Cereal Chemists' Monograph Series would appear to cover the subject most completely. The first six chapters deal with moisture, chemical and physical changes with time, microflora, respiration and heating, insects and rodents. The last five chapters, by contrast, deal largely with areas in which practical experience is the chief source of knowledge.

Successful Dairying, by C. B. Knodt; McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y. 1954, 381 pp., 180 ills., 8 color plates, 24 tables.

53-5169

The professor of dairy husbandry at the Pennsylvania State College here presents information on the most recent proved practises for the successful operation of a dairy farm. For both the beginner or the established dairyman it should be a reliable source of information. There are 67 pages of plans for approved housing alone. There is an appendix with a list of agricultural colleges in the U. S. A. and Canada; another of bulletins and leaflets available from the U. S. Department of Agriculture; a third with the addresses of farm magazine; the fourth with supplementary texts; a sixth with complete dairy record forms; and a sixth with correlated visual aids.

— T —

Taxonomy, The Language of, by John R. Gregg; Columbia University Press, 2960 Broadway, New York 37, N. Y. 1954, 70 pp., $2.50

54-9363

One of the Columbia University Bicentennial Studies, this application of symbolic logic to the study of classificatory systems distinguishes between taxonomy proper and methodological taxonomy, which doesn't deal with organisms at all, since its concern is with the resolution of philosophical issues generated by the results of taxonomical research, nomenclatural rules, etc.

Teaching Vocational Agriculture, by E. W. Garris; McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y. 1954, 393 pp., 190 figs.

53-5162

A teacher in vocational agriculture should be proficient in group and individualized instruction, have a working knowledge of public relations, be a skilled mechanic, and be able to meet all other problems common to public school teachers. This is what the head of the department of agricultural education in the college of education and agriculture at the University of Florida has very attractively set forth in this new book.

Treasure Diving Holidays, by Jane & Barney Crile; The Viking Press, 18 East 48th St., New York 17, N. Y. 1954, 263 pp., 51 ills., 1 map, $3.95

54-6426

Dr. George Crile, Jr. of the Cleveland Clinic and his wife have written one of the most interesting books that has come across our desk in many months. In it they describe, wittily and colorfully, the experiences they and their four youngsters have had skin-diving in Lake Erie, at La Jolla, at Tortugas, off Corsica and the Bahamas. There is more practical zoology in the book than one might at first suspect, much of it along the line of animal behavior. For a zoologist with fishy hobbies this would be a wonderful gift.

Trees And Shrubs of The Southwestern Deserts, by Lyman Benson and Robert Darrow; The University of New Mexico Press, Albuquerque, New Mexico. 1954, 437 pp., 84 figs., 34 plates in color, $8.50

53-7210

This is the second and slightly revised edition of the original University of Arizona "Manual of Southwestern Desert Trees and Shrubs" published nine years ago. It contains a 44-page introduction, part descriptive of the desert and its vegetation, part instructional on taxonomic techniques. The rest of the book is straight taxonomy with a difference. Following the key to each species is an ecological habitat description.

— U —

Underwater Photography, by Hilbert Schenck and Henry Kendall; Cornell Maritime Press, Cambridge, Maryland. 1954, 110 pp., 60 figs., $3.00

53-9688

With two added chapters, one by David Owen of the Woods Hole Oceanographic on recent developments in that region, and another by Jerry Greenberg, noted illustrator for slick magazines, the authors who have previously published a book on shallow water diving and spearfishing, here give science the benefits of the best and latest information on how to make all kinds of underwater pictures. Even if one has no call for the immediate use of this knowledge, it is still fascinating, especially to biologists.

— V —

Vertebrate Dissection, by Warren F. Walker; W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa. 1954, 331 pp., 62 figs., $3.50

54-7691

Here the associate professor of zoology at Oberlin College presents a laboratory manual which may be what the doctor ordered for colleges. The book is mainly based on the fish (with dogfish as example), the primitive tetrapd (mud-puppy), and the cat and rabbit as examples of mammals. Dr. Walker has a unique, as far as we know, system in his laboratory classes, and give alternate students cats or rabbits to dissect. The inevitable comparisons this generates should be stimulating.

Viruses And Man, by F. M. Burnett; Penguin Books, 3300 Clipper Mill Road, Baltimore 11, Md. 1953, 197 pp., 20 ills., 5 figs., $0.50

This is another of those compact and inexpensive little handbooks which are so typically British, and so well done. The author is director of the Walter and Eliza Hall Institute of Medical Research and Professor of Experimental Medicine in the University of Melbourne. His approach to each of the viruses is definitely ecological.

— W —

Wine as Food And Medicine, by Salvatore P. Lucia; The Blakiston Division, 330 W. 42nd St., New York 36, N. Y. 1954, 149 pp., $3.00

54-7397

The professor of medicine at the University of California School of Medicine here presents a very closely documented argument which should have no deleterious effect on the chief industry of the great state which supports his school. It is good, however, to see that economics are bringing about a gradual rationalization of culture-habits which have been with the human race (if we still believe the Bible) since the days of the patriarchs. European derision of the American cult of the water cooler here receives medical justification, the late Prohibition Amendment to the contrary notwithstanding.

Within The Living Plant, by Erston V. Miller; The Blakiston Division, 330 W. 42nd St., New York 36, N. Y. 1953, 325 pp., ills.

Designed for an undergraduate course, this plant physiology not only presents the fundamental principles of plant physiology, but it focuses attention on the manner in which it may affect the life of the individual, such as questions related to home gardening, vegetation in teh natural landscape, market fruits and vegetables, or processing and transportation of plant foodstuffs. The author formerly was connected with the U. S. Department of Agriculture as physiologist.

Wonders of The Human Body, by Anthony Ravielli; The Viking Press, 18 East 48th St., New York 17, N. Y. 1954, 125 pp., ills., $2.50

An artist with a skeleton in his studio was plagued with questions by the young fry among his relatives as to what it was used for, and why, and all the rest of the implications it aroused. gave him an idea. That idea is one of the neatest jobs on the mechanics of the human body, couched in terms understandable by young folks, and illustrated in scientifically correct two-toned drawings, that has come from any printin gpress in a long, long, time. It would make any grade-school youngster a very acceptable Christmas or birthday gift. It has a special appeal to the young Scout.

IN PAPER COVERS, OR NONE

Annual Report For 1953, by M. B. Dickerman; U. S. Department of Agriculture Forest Service, University Farm, St. Paul 1, Minn. 54 pp., No Charge.

Anyone professionally interested in the work of the Lake States (Minnesota, Wisconsin, Michigan) Forest Experiment Station will get a comprehensive view of it, and plans for the future from this interesting report.

Chemical Pathology of Animal Pigments, ed. by R. T. Williams; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954, 84 pp., $2.75

Biochemical Society Symposia No. 18 with contributions by Rimington, Muir, Falk, Goldberg, Lathe, Gray, Gibson and Godwin, dealing with Porphyrins, Bile Pigments, Methaemoglobin and Sulphaemoglobin and Carotenoids.

Educators Guide to Free Films, 1954, 566 pp., $6.00; **Educators Guide to Free Slidefilms,** 1954, 209 pp., $5.00 Educators Progress Service, Randolph, Wis.

These two books should at least be available in every college or University Library. With a little forethought and prevision many a dull class, and even duller association meeting, could be enlivened by a motion picture, or a set of slide films. With a plethors of material available, there is absolutely no excuse for talking groups to death. If more use were made of people's eyes and less of their ears, the more they would learn. After all, it is not "Hearing is believing," that is the proverb.

Elementary Plant Physiology, by Erston V. Miller; The Boxwood Press, Pittsburgh 13, Pa. 1954, 27 pp., $1.25

This is the laboratory manual to accompany the author's book "Within the Living Plant" mentioned above.

The Discovery of Unicellular Life, by Antoni van Leeuwenhoek.

This 15-page KEEPSAKE was issued on the occasion of the opening of Professor Waksman's new Institute of Microbiology at Rutgers University. It consists of reprints of the 7 September and 9 October letters of van Leeuwenhoek to Oldenburg of the Royal Society of London. Copies are available without charge from THE CHRONICA BOTANICA CO., Waltham 54, Mass. Libraries should know that the publication of the collected van Leeuwenhoek letters has reached th 4-volume stage. Volume Five is in an advanced stage of preparation. They are available from the same source.

Philippine Islands, by Helen Abrahamson; Pacific Books, Box 558, Palo Alto, Calif. 1954, 96 pp.

This is a handy little guidebook to the Philippine Islands. It should help to whet the interest of Americans in the "Pearl of the Orient." To one who saw Manila in flames during the liberation days of 1945, the Islands appear to have made a near-miraculous comeback. It is a credit to the energy and intelligence of the Filipino people.

The Place of Botany in The Life of A University, by C. D. Darlington; Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 1953, 23 pp., $0.40

An inaugural lecture delivered before the University of Oxford on 27 November 1953, might give many a professor who is somewhat at a loss for ideas, an excellent theme for meditation, and/or oration. Starting with a definition of botany, its origins and uses in medicine and food, the learned author discusses the origins of cultivated plants, the ideological conflicts of the 17th and 18th centuries, then cells and microscopy, choromosomes, viruses and plasmagenes, then the newer conflicts of the 19th and 20th centuries, the misunderstandings of botany on the part of people and governments, and ends with the new use of botany. One would like to know the background behind this beautiful apologia for one branch of science. In our ignorance we shall have to be content that whatever it was it proved the threshold reaction for so well turned a lecture.

Serological Approaches to Studies of Protein Structure And Metabolism, ed. by Wm. H. Cole; Rutgers University Press, New Brunswick, N. J. 1954, 97 pp., 46 figs., $2.00

53-753

The symposium of which this is the report was held at Rutgers on 29 and 30 January 1954. Contributing papers were read by Drs. Alan A. Boyden, Melvin Cohn, David Gitlin, Felix Haurowitz, Michael Heidelberger and J. Munoz.

Systematic Study of The Avian Family Fringillidae, by Harrison B. Tordoff; University of Michigan Press, Ann Arbor, Michigan. 1954, 61 pp., 77 figs., $0.75

This is No. 81 in the Miscellaneous Publications of the Museum of Zoology, University of Michigan. It is a painstakingly exact doctoral thesis which therefore could not be expected to be of any interest to anyone except the examining board, and professional ornithologists. In summarizing this work we have come to the conclusion that the author is suggesting a reclassification of the finches and their allies, into two groups, the vireos, finches and allies, and the weaverbirds, linnets, etc.

Transactions of the San Diego Society of Natural History received since our last issue:

Volume XI, Title Page and Contents
Volume XI, Index
Volume XII, No. 1, A New Form of Prognathus Formosus, by Laurence M. Huey

2. Preliminary Revision of the Genus Pselaptrichus, by Gordon Marsh & Robert O. Schuster
3. Fossil Pit-Vipers of North America, by Bayard H. Brattistrom
4. Analysis of the Herpetofauna of Baja California, by S. H. Lowe and K. S. Norris
5. Snakes of the Islands in the Gulf of California, by Frank S. Cliff

Occasional Papers of the San Diego Society of Natural History received: West Coast Marine Shells, (Revised Edition), by Myrtle E. Johnson, No. 9, June, 1954.

University of Kansas Publications, Museum of Natural History, received since our last issue:

Vol. 7, No. 3, The Silky Pocket Mouse, Prognathus Flavus, by Rollin H. Baker

4. North American Jumping Mice (Genus Zapus), by Philip H. Krutxsch
5. Mammals from Southeastern Alaska, by Rollin H. Baker and James S. Findlay
6. Distribution of Some Nebraskan Mammals, by Knox Jones, Jr.
7. Subspeciation in the Meadow Mouse, Microtus Montanus, in Wyoming and Colorado, by Sydney Anderson
8. A New Species of Bat from Southeastern California and Arizona, by Terry A. Vaughan

EDITORIAL

ERWINE HALL STEWART, ESQ.

The Man Who Made Phi Sigma

When Erwine H. Stewart withdrew his name from the nominations during the Phi Sigma meetings at the University of Florida on September seventh, he was ringing down the final curtain on more than thirty-seven years of unselfish, unpublicized, and, as is so often the case, greatly unappreciated service to the biological honor society he had helped to put upon its feet, and to guide on its way to the position it now holds in the educational world.

Erwine Stewart was born in Utica, Nebraska, sixty-five years ago. In his eighth year his parents moved to a ranch some distance from Mesa, on the western slopes of the Colorado Rockies. Here, amid all the traditional activities and responsibilities of a stockman and a rancher, he grew up until it came time for him to enter high school. His folks sent him to Warren Academy, a preparatory school conducted by, and on the campus of, the University of Denver. He graduated with honors in 1912. Staying on at the University, young Stewart registered as a freshman, and spent most of his time in the biology laboratory. In fact from the very first, he functioned in one or the other capacity as an assistant in the Biology Department. A number of biology majors in which he was included secured the backing of their department head, the late Dr. Ira E. Cutler, and in December of 1912 established a biological fraternity at Denver, known as Pi Beta Omega.

After his graduation with a B.A. degree in 1915, Stewart continued his work in the field of his main interest in the graduate school. On 5 March of 1917 the Denver biological fraternity was incorporated into Phi Sigma as Epsilon Chapter. Its secretary at the time was Erwine H. Stewart. His first contribution to the Spring issue of "The Biologist" that year was a history of the new chapter from its beginning. Among the members of that charter group was a Wayne N. Aspinall, who was later to represent his state in Congress.

About this time young Stewart had to drop out of graduate work in order to lend a hand on the family ranch. This did not affect his interest in his studies. He contributed a research paper entitled "Fauna and Flora of the Florissant Beds," to the June issue of the society's magazine. It dealt with the rich fossils which he had seen or helped to collect in his many trips to the site where the British Museum force had made their 1877 investigations. In his paper he named some 24 fossilized plants and several animals that had been added to the University of Denver collection from the spot.

Despite the fact that he was not in residence in that Spring of 1917, he was nominated and unanimously elected to what was then known as the office of "Grand Secretary-Treasurer of Phi Sigma." An anonymous Denver contributor to one of the earlier issues of "The Biologist" shortly thereafter wrote: "Erwine Hall Stewart has always been distinguished for a lively interest in all activities in college, for his outspokenness, his loyalty to his friends and the institution with which he is connected, ready to lend a helping hand in any good cause. . . . He was active in establishing the chapter of Lambda Chi Alpha at the University of Denver, and for some years he was the National Treasurer of that fraternity. . . . Mr. Stewart can always be depended upon to do the thing at hand in the most efficient and business-like manner." The ensuing years were to prove how right that writer was.

"There are kings and queens in his family tree"

Erwine Hall Stewart

Secretary-Treasurer	1917-1921
Treasurer-Editor	1921-1923
Treasurer of Phi Sigma	1923-1950
Vice-Chancellor	1950-1954

By this time the tentacles of the First World War were dragging the United States students into the European conflict. This was apparent from the tenor of some of the Chapter Letters in the very issue in which the Stewart paleontological paper appeared. Incidentally, that was the last issue of "The Biologist" to appear "for the duration."

Young Stewart enlisted in the Army Medical Corps, and after two years training in this country, spent a year in England. This gave him a chance to take courses in Kings College of the University of London. In his free time he had a chance, golden to one with his background which traced its ancestry back to the Stuarts, to see many of the historic spots in which his famous ancestors had figured. Erwine Stewart came by his chivalry naturally, it was in his blood, and the British year made him appreciate it.

On his return to civilian life and Colorado, Stewart lost no time in completing his graduate work for the M.A. which was conferred in 1920. It was good for Phi Sigma that he returned to his studies. To all intents and purposes the society was comatose if not moribund. Most of its membership were in Service, no elections had been held, and the magazine had suspended publication. Former members who returned to their schools were mostly intent on getting their degrees and getting out of college or university as quickly as possible. It looked as if Phi Sigma would be a war casualty too. The day was saved for the young biological society by National President Emory W. Sink, Past National President Carlos I. Reed, and National Treasurer Erwine Hall Stewart. Scattered as they were, by dint of much correspondence, they got out an interesting and challenging issue of "The Biologist." By means of a terrific barrage of letters to all and sundry who might be interested they succeeded in giving Phi Sigma the shot of adrenalin it needed and it revived. That first post-World War I issue of "The Biologist" had a new Editor, who was to continue in the post for two years, E. H. Stewart.

That the grim and determined efforts of those three national officers were effective is evidenced by the fact that when Stewart turned over the editorship to Robert C. Miller of the University of California in 1922, the Chapter Roll had grown from five to twelve. By 1924 there were enough members, and chapters, to warrant holding a meeting, the first on a national scale, to rewrite the constitution and settle in convention all those problems which had arisen during the formative years, and which it was almost impossible to settle by interchapter correspondence. The sessions were held during the A.A.A.S. meetings in Washington, D. C. in the holidays of 1924. Fourteen Chapters were represented, and a number of alumni members as well as the National Officers were inattendance. Mr. Stewart was prevented by unavoidable circumstances from attending. He sent in his annual report, and a letter of considered recommendations for adoption. The National Secretary, Dr. C. I. Reed, read the letter to the assemblage and added a few remarks of his own: "To supplement that report, I would like to say that Stewart deserves the hearty cooperation of everybody. I admire him very much. So far as his business is concerned, he is interested, but he is first of all a naturalist. He lives forty miles from the railroad, and in spite of the isolation, he is a busy man; he writes a great deal, and has to write letters for many of his neighbors. He has kept up his own interest in everything concerning Nature. He is a biologist, a botanist, and geologist, a general naturalist. He has kept up his scientific interests, and after a hard day's work, he gives his time and energy to the work of Phi Sigma. He is doing this purely for the love of the work. This gives him a touch with the scientific world he loves, and wants to be associated with."

The truth in Dr. Reed's words was to be proven during the great depression of 1928 to 1930. When it hit the collegiate world, many a fraternal structure toppled, never to be rebuilt. Phi Sigma weathered the storm, in spite of its small financial resources. How it was managed is a secret that is known only to Erwine Hall Stewart. It is of record, however, in the pages of "The Biologist," that from another National Meeting Mr. Stewart was again absent. Funds were low in the treasury, so, rather than deprive some poor chapter delegate of his little fare-and-a-half which the railroads demanded in those days, the National Treasurer stayed at home and tended his ranch.

An active and staunch member of the Episcopalian Church, a York and Scottish Rite Mason, a Son of the American Revolution and a Mayflower Descendant, Erwin Hall Stewart has never married. He has given his vicarious parenthood to the many organizations in which he takes such active interest, as well as to youth activities in his home neighborhood. These, his parents, the family estate, and the western slopes cattlemen's association to which he belongs occupy all the time he has.

The Editor of "The Biologist" first met "Erv" at the Kansas City meetings in 1925. It wasn't long before we were calling one another by our first names. His quiet diffidence, almost to the point of a deceptive shyness, has always made him a host of friends. When, however, a point is at issue on which he has convictions, the shyness vanishes, and he can rival the most outspoken. Despite all this, his is not the type of personality which exploits others for his own interests. Now that he has relinquished his active participation in the affairs of Phi Sigma, he will be free from those responsibilities which such offices always entail for those who accept them conscientiously. Erv is not a "joiner." The organizations he participates in have to challenge his devotion to principle.

There are those of us who will miss him.

Doris O. Monroe has accepted a position as an associate microbiologist with the microbiological research department of Eli Lilly and Company, Indianapolis. Her work is concerned with research tracing the development of resistance to antibiotics by various micro-organisms.

Miss Monroe is a native of Wooster, Ohio, where she was graduated from high school in 1948. She received a Bachelor of Science degree in 1952 from Miami University, Oxford, Ohio. Her Master of Science degree in bacteriology was conferred this year by Purdue University.

Miss Monroe is a member of the Society of the Sigma Xi, scientific honor society; Sigma Delta Epsilon, honor society for graduate women in science; and *Phi Sigma*, biology honor society.

PROCEEDINGS OF THE GENERAL MEETING

University of Florida
Gainesville, Florida
September 5-8, 1954
(*Meeting as part of A.I.B.S. Program*)

Evening, Sept. 5th

After dinner refreshments and open forum on the ecology of Florida. Both of these were an excellent way of getting acquainted with each other and with Florida. The forum was a particularly good coverage of the flora and fauna of a region quite different from the rest of the United States. Papers were given by Drs. Hubbell, Laessle and Brodkorb.

Morning, Sept. 6th

The first general session was called to order by Chancellor Lagler.

*Chancellor's Welcoming Statement to the Delegates*S

"The purpose of this brief statement is to welcome the delegates to this biennial convention of Phi Sigma. I do cordially welcome you and the members of The Council to this gathering.

"The broad aim of Phi Sigma Society is to stimulate interest in biological research. One does not get this stimulation merely by attending meetings and listening to the adventures of colleagues and teachers in research, but rather by entering into discussion at meetings with folks from the many phases of biological endeavor, who are present. At a meeting such as this in collaboration with the American Institute of Biological Sciences, the opportunities to find out what is going on in fields of specialization allied to yours are extremely rich. I urge that you make the most of them. You, the delegates at this convention, are a chosen few, perhaps one in a hundred members of Phi Sigma. It is, further, your obligation to transact successfully, and in the direction in which its members desire it to go, the business of the Fraternity.

"The Council of Phi Sigma which you see assembled here before you at your request, is elected for gratis service. The service it renders is to carry out the directives of the constitution and the instructions of conventions. Its primary function is to afford continuity in the affairs of the organization. I urge that you enter wholeheartedly into the deliberations of this biennial meeting and that you give full voice to the instructions and sentiment of your respective chapters.

"You are all aware that the house organ of Phi Sigma Society is the *Biologist*. This periodic publication welcomes contributions from all members and others. These contributions are essentially of a nonresearch nature but rather tell the story of research, how it is begun, and how it is developed. It also relates how the wise choices of what to do, and what not to do, are made. Members and delegates are never endingly critical of this journal but consistently fail to supply good material from which selections may be made for filling its pages. You will hear a report of a change of plans by the editor during the past year which assures speedier delivery of the journal to members and also reduces the cost to the national organization.

Roll Call and Certification Report of Delegates Present (23)

Beta (Michigan) Kormondy
Epsilon (Denver) Miss Dotson
Zeta (Wisconsin) Miss Jones
Kappa (Kansas) Hayden
Lambda (Montana Univ.) Sears
Pi (Emory & Agnes Scott) Fetner
Sigma (Florida) Haubrich
Upsilon (Miami) Miss Kautz
Psi (Washington) Miss Snyder
Omega (Oklahoma) Miss Peissner
Omega Alternate (Oklahoma) Miss

Cox
A. Alpha (U.S.C.) Miss Hartman
A. Epsilon (Pittsburgh) Olah
A. Iota (Bucknell) Miss Skow
A. Kappa (Hunter) Miss Badami
A. Mu (Oregon State) Cohen
A. Nu (New Mexico) Miss Mathews
A. Xi (Rhode Island) Smayda
A. Omicron (Marquette) Miss Wood
A. Pi (Colorado) Helms
A. Rho (Arkansas) Teresa
A. Chi (Philippines) de la Paz
A. Psi (Va. Polytech) Brennan
A. Omega (Georgia) Miss Dunn

Report of the Exec. Secretary was called for by the Chancellor. The following items were briefly presented:

1. "Correspondence with the chapters has been quite heavy but has, nevertheless, been very pleasant. Secretary extends his thanks to all those chapter officers who have been so patient and cooperative in accomplishing the business of the society.

2. "It has been noted that activity and accomplishment in the various chapters seem to follow a sine curve, fluctuating up and down. The down periods seem to require great effort on the part of new officers to revive the chapter. When two or three sets of officers consecutively let the chapter activity slide it is hard for everyone concerned (including the Exec. Secretary) to build it back up again. Delegates can help to guide their chapters in picking officers on the basis of ability and reliability rather than popularity.

3. "The numbers of students available for Phi Sigma members has gone steadily down hill with general enrollments. An appraisal of the situation makes it appear that Phi Sigma has probably hit the low point in numbers of initiates this past year. $ncreased enrollments should mean greater activity in the chapters during the next two years.

4. "Report on initiates to date:

Total reported at 1950 General Meeting	17,677
Initiates through academic year 1950—1951	984
Initiates through academic year 1951—1952	863
Initiates through academic year 1952—1953	745
Initiates through academic year 1953—1954	722
Total	20,991

5. "Correspondence has been carried on with 18 qualified schools as prospective Phi Sigma chapters. Three inactive chapters have expressed a desire to reactivate. The probability is that we will have one reactivation and one or two new chapters this coming year. All of the active chapters should make attempts to contact groups they feel should and would like to affiliate with Phi Sigma.

6. "Ordinarily the chapters can expect to get very prompt service in ordering of membership certificates, but it would be appreciated if the delegates would help chapters to be patient when records come to the national office with inadequate or incorrect information. The Exec. Secretary is not authorized to order certificates until candidates records are complete and fees are paid.

7. "Several matters of business have been brought to the attention of The Council. These have been discussed at length by The Council and some will now be passed on to the "Committee on Constitutional Amendments" of this convention.

8. "In some few chapters it has been found that the files have been kept so poorly that new officers have had difficulty in carrying on the business of the chapter. It is suggested that each delegate could personally determine if his chapter records are in order and are kept in a definite campus location as provided for in the constitution."

Appointment of committees was made by Chancellor Lagler as follows:

Auditing: Zeta (Chm), A. Kappa, A. Chi, (Treasurer)

Nominating: A. Xi (Chm), Beta, Epsilon, A. Nu, A. Rho, (Exec. Sec.)

Constitutional Amendments: Omega (Chm), Psi, A. Alpha, A. Epsilon, A. Mu, A. Pi, Omega alternate, (Chancellor)

Biologist: Sigma (Chm), Upsilon, A. Iota, A. Omicron, A. Psi, (Vice-Chan.)

Resolutions: A. Omega (Chm), Lambda, Kappa, (Council)

Report of Treasurer was called for by the Chancellor.

Certain difficulties encountered during the past year or two has led the Treasurer to believe that her "resignation would serve the interests of the society best." She thereby submitted her resignation.

The Treasurer gave approximate amounts in the accounts of the society as follows:

Checking account	$2,066
Convention fund	3,781
Endowment fund	2,714

She explained that the "Endowment fund" is a reserve set up to take care of society obligations in case of difficulty, but that ordinarily there is no occasion to withdraw from that fund.

Kappa requested information as to the sources of that fund. The Treasurer answered as follows: From the checking account when it is large enough to warrant, from royalties on Phi Sigma Keys, and a small amount from life subscriptions to the *Biologist*.

Kappa requested approximate cost of *Biologist* per year. Answer $1500.

Kappa also wished to know if the society is "holding its own or is there a net loss because of lower number of initiates". The answer given was that there was no cause for alarm concerning the financial structure of the society.

Report of the Editor of The Biologist was called for by the Chancellor.

A number of problems regarding the mechanics of production of *The Biologist* were presented and discussed by the Editor. He outlined how the last convention had requested a change in printers and a reduction in costs, how he had accomplished this, and how he greatly needs the help of each chapter in furnishing material for the society's publication. He urged that the delegates see that their own chapters elect an editor as provided for in the constitution, and that the chapters give aid and encouragement in furnishing the Editor of *The Biologist* with material worthy of publication. Such material could include papers given locally at meetings or dinners, interesting items of scientific news on the local campus or news of members that might be of national interest. Individual investigational reports are to be discouraged because *The Biologist* is a "house organ" designed to give news items and notices of importance to the society and also papers of general interest to biologists.

It was necessary for the Editor to leave the convention following his report, but it was fortunate that he could be at the General Meeting long enough for the delegates to become acquainted with him.

Afternoon, Sept. 6th

The five committees met to discuss their individual problems and prepare their reports.

Evening, Sept. 6th.

The convention banquet was held at the Primrose Grill, Gainesville. The Chancellor was toastmaster and introduced a number of guests and old friends of the society.

The main address of the evening was given by our Honorary President, Dean Laurence H. Snyder, and was entitled "Biologists Are People". This address will appear in printed form in an early issue of *The Biologist*.

Later in the evening there was a general meeting of all participating societies of the A.I.B.S. Dr. H. Bently Glass, Chairman of the A.I.B.S. Governing Board presided, and an address was given by Dr. A. F. Carr, Jr., University of Florida, entitled "The Passing of the Fleet".

Morning, Sept. 7th.

Vice-Chancellor Stewart introduced Dr. Sears (former very active member of The Council). Dr. Sears is now Professor of Conservation of Natural Resources at Yale. Dr. Sears made a few remarks to the delegates in which he remarked that it is so easy for one to become absorbed in his own specialty. He said he was impressed in his early days in Alpha chapter how Phi Sigma created an awareness of other biological fields to the point of realizing the importance of the contribution other fields of science could make to one's own work, and even to good citizenship.

Report of Constitutional Amendments Committee called for by Chancellor.

The Chair ruled that each amendment presented for consideration be discussed and voted upon individually by the convention.

The Committee chairman presented the following report:

"Each of the following amendments for the constitution of Phi Sigma was unanimously approved by the committee after very careful consideration. Several of the proposed amendments are recommendations submitted to the committee by The Council:

1. That all national business of the Society be consolidated into one Council office under one Council member.
2. That because of the foregoing, the Council office of Treasurer be terminated.
3. That the number of members on the Council be returned by the above action to four in number instead of five, thus making the constitutional provision of three-fourths vote for action more realistic.
4. That to eliminate some present confusion, the titles of the Council members be revised to:
    a. Honorary President (non-voting)
    b. President
    c. Past-President
    d. Vice-President
    e. Executive Sec. Treas. (to handle all Society business subject to Council policy and approval, accounts to be audited, and individual holding office to be bonded.)

The committee approved the recommendation *in toto* except for the words "Executive Sec.-Treas.". It is suggested that the title be "Secretary-Treasurer" instead."

Treasurer Clare spoke to the delegates at length concerning the importance of such a step to the society as a whole and recommended that the matter be referred to the chapters.

Several delegates commented that the chapters had officially given authority to the delegates to act in their behalf on all business matters. Alpha Nu pointed out that it might be impossible to present a full and clear picture of the situation to the chapters as it had been presented to the delegates because each delegate could not help but discuss it with his chapter in a somewhat biased form.

Alpha Nu moved that the convention vote as to whether the delegates wished to take the responsibility of so interpreting the constitution that they had the authority of acting on constitutional amendments as delegates in previous conventions have done.

Alpha Rho made a second to the motion.

It was requested that an individual poll of each delegate be made.

The vote was unanimous to accept the responsibility in convention.

Alpha Pi moved to accept the plan submitted by The Council. Beta made the second. The vote by all delegates present (19) was unanimous to accept the plan. The absent Sigma delegate returned later and was given an opportunity to record his vote, which was against.

The "suggestion" of the committee to delete the term "Executive" from the office of "Executive Secretary" was not discussed. Two difficulties would arise if this were done, however; it has been found from experience that confusion arises in a great deal of correspondence if there is no difference between the name of the Council office and the chapter office; unless there were some vital reason for making such a change it would not be advisable because such a change would involve considerable cost in expensive changing of printed forms now in stock. Since the change was a "suggestion" on the part of the committee and was not discussed, the consolidation of Council positions passed in this amendment merges the offices of Executive Secretary and of Treasurer into the new office of "Executive Secretary-Treasurer."

The Chair instructed that a line by line revision of the constitution be made to embody the amendment just passed.

"Article III. Sec. 3, line 3, page 7. The words "permanently located in the community" are to be replaced by "of the rank of Assistant Professor or higher from one of the departments from which members are elected (exceptions may be approved by the Council). The term of office shall be four years. A separate advisor may be elected for a *shorter* term if so desired." Beta moved adoption subject to final approval after incorporation into the constitution. Lambda seconded the motion. The vote was unanimous for adoption.

"Article IV. Sec. 4, line 1, page 10. Following the word "faculty", insert "in any of the biological sciences". There was quite a bit of discussion about limitation of faculty eligibility, particularly by Beta, Sigma, A. Nu, and Psi. It was decided by these delegates to move an amendment to the amendment so it would read "having a biological interest". This amendment to the amendment when placed to the vote was 10 for and 11 against. Psi then moved that the original amendment be adopted. A. Epsilon seconded. The amendment carried with only 4 against.

"Article V. Sec. 1, line 3, page 11. Delete "Recording Secretary and Corresponding Secretary" and in lieu thereof just the word "Secretary". To this section the following sentence should be added: "If the functions of the chapter require two secretaries, one for correspondence and one for recording, such chapter officers may be elected". A. Epsilon moved adoption of the amendment. A. Pi seconded. The motion was carried unanimously.

"Article V. A section of this article should be devoted to "The special duties of the Vice-President". This should read: "The special duties of the Vice-President as chairman of the membership committee shall be to make all necessary contacts with the Executive Sec.-Treas. regarding candidates for membership." Beta moved adoption of the amendment. A. Omega seconded. The amendment carried by unanimous vote.

"Article VII. Sec. 1, page 14. Delete entire section and replace it with "It is mandatory that each chapter have a minimum goal of four business meetings for each school year". A. Rho moved adoption of the amendment. A. Kappa made the second. A. Nu wanted to know why the amendment was necessary. It apparently would lead to decreased activity. A. Pi suggested that a minimum number per year be set instead of the one per month as currently in the constitution. A. Rho felt the same way and said that one per month "ties the hands of the chapter Executive Committee." A. Psi suggested 8 meetings a year as a minimum. A show of hands indicated that the constitution could stand some revision on this point. A. Psi suggested distinguishing between social and business meetings. A. Nu said that some care should be exercised on this point in allowing too much latitude. A. Rho suggested specifying types of meetings. Vote on the original motion: in favor—11, against—8. This was not the required three-quarters vote, and therefore motion not carried.

After considerable discussion on this motion A. Nu proposed tabling. A. Epsilon seconded this motion. Vote to table any amendment of this type was carried, but a desire expressed to return to further discussion of it if time permitted later in the convention.

"Article VIII. Sec. 1, 1st sentence, page 14. Delete sentence and replace it by "At least once during each school year the membership Committee shall recommend such persons as are eligible for election." The purpose of this amendment is to remove the mandatory clause now in the constitution that such recommendation be made both fall and spring. It was moved and seconded that the amendment be adopted. Motion carried.

"By-Laws. Sec. 1, (a), line 10 page 16. Following the word "option" add "with individual members unless there is a provision otherwise stated in the chapter's by-laws". The Exec. Sec.-Treas. explained that this was to clarify a constitutional provision on which several chapters had asked for a ruling. A. Chi moved adoption. Pi seconded. Vote was unanimously for the amendment.

Afternoon, Sept. 7th.

Report of Auditing Committee called for by the Chancellor. The report was presented by the chairman of the committee.

1. "The Committee recommends that the Treasurer's books be completely audited before changing hands." It was pointed out by discussion from the floor that resignation of the Treasurer makes audit of Treasurer's books by certified public accountant necessary. A. Rho moved that the recommendation be accepted. A. Omicron seconded. Motion was carried by unanimous vote.

2. "The Committee recommends that the Exec. Sec.-Treas. draw up and present to each chapter president, prior to the biennial meeting, a financial report and budget plan." In response to a question from the floor as to the general budgeting of each $7 initiation fee the Treasurer said the following is suggested: Biologist $3, Convention $1, and Current Operation $3, subject to revision by the Exec. Sec.-Treas. as needed. A. Nu moved that item No. 2 in the report be accepted. A. Psi seconded. Vote for acceptance was unanimous.

3. "The Committee recommends that in the above-mentioned budget, an amount be set aside for the payment of a part-time employee. The duties of this employee would be primarily to aid the secretary in clerical work, but his services would also be available to other members of the Council in Phi Sigma business. An effort should be made to select a responsible person, living near the secretary, a person who will hold the position for the duration of the secretary's term of office if possible. He need not be a member of Phi Sigma."

It was explained to the delegates that this is a matter that can be taken care of by Council action in carrying out the necessary national business of the society. The problem can be met from time to time as the need warrants. Sonsequent to this explanation no vote was taken.

4. "The Committee recommends that in the future token tickets be distributed free of charge to certain persons attending the banquet, and that all other persons pay a fee to be set according to the cost of the banquet. Persons to receive such tickets without charge should be members of the Council, official delegates, and guests of honor." A. Mu moved acceptance. A. Omega seconded. Motion carried unanimously.

5. "The Committee recommends that the delegates to this convention be reimbursed for convention expenses including the following: The amount of first class railroad fare to and from the convention as quoted by railroad. Room rent not in excess of four nights

at $2.25 per night. Registration fee of $3.00."

These three expenditures were voted on separately, motions made as follows: A. Chi, Beta, and A. Epsilon. Seconds were made by Omega, A. Xi, and A. Pi. All three voted on separately and carried unanimously.

Report of The Biologist Committee called for by the Chancellor. The report was presented by the chairman of the committee.

1. "Chapter participation (mostly a re-emphasis of the constitution). Each chapter should duly elect an editor whose duties should consist of keeping data on:
   - a. Promotions and awards to members.
   - b. Names and short biographies of nationally noted members.
   - c. Names of members who transfer positions.
   - d. Names of initiates.
   - e. Noted alumni and other alumni nearby.
   - f. Number of copies desired for particular chapter.
   - g. Keep list of actives, alumni, faculty, honorary members and others to receive journal.
   - h. Should see that major libraries in area of chapter have copy.

2. "Journal distribution. The chapter editor should be responsible for distribution of journal to the respective persons receiving it. Chapter editors need to pay attention to wise but wide distribution."

Considerable discussion followed over the question of free or restricted distribution. Delegates finally voted to leave the question of distribution up to the judgment of the chapter editor.

3. "Student Papers. A major effort should be made by the national editor to encourage publication of student (graduate and undergraduate) independent research if such work has a note of verification from the major professor."

A rather heated discussion by the delegates over this point centered around whether such a practice would lower the quality. The general idea seemed to prevail that the editorial policy of *The Biologist* would have to rest in the hands of its editor. We are fortunate, indeed, to have an editor who is earnestly seeking the aid of chapter editors, and the latter should feel very free or even obligated to discuss contributions to *The Biologist* with him.

4. "Advertising possibilities. At the present time advertising in *The Biologist* is not possible because publication is not a consistent event. If enough material is received to make publication a regular event then an effort should be made to include advertising."

5. "Purpose of *Biologist*.
   - a. Means of intercommunication among chapters and between chapters and The Council.
   - b. Act as an outlet for Phi Sigma news and works.
   - c. To publish biological articles of interest, and to act as an outlet for worthy graduate and undergraduate work in addition to the regular articles.
   - d. To act as a public relations vehicle."

A. Pi moved acceptance of the report of the committee. A. Psi seconded. Vote was unanimous for acceptance.

Report of the Nominating Committee was called for by the Chancellor, and was presented by the chairman.

"The nominating committee unanimously places Dr. Edward Castetter, Dean of the Graduate School, University of New Mexico in nomination for the office of Vice-President.

"Dean Castetter is amply qualified for this office in that he is both willing and able to assume the responsibilities of the office; he has maintained a long continuing interest in Phi Sigma on the national level and has been faculty adviser of Alpha Nu Chapter. He is an eminent botanist and has contributed much to his field of research. Also the fact that he is friend and colleague of our present Vice-Chancellor, Erwine H. Stewart, speaks highly of his qualifications."

A. Epsilon immediately placed the name of Erwine Stewart in nomination, but the nominee requested that his name be withdrawn.

A. Mu nominated Tema Shults Clare.

A. Chi moved that the nominations be closed. A. Alpha seconded.

Mrs. Clare spoke regarding her knowledge of Dean Castetter and the part he has played in Phi Sigma.

Mr. Stewart also told the delegates what he knew about Dean Castetter and his part in the convention several years ago.

A long discussion followed regarding The Council and succession of offices in relation to continuity and vitality of the national organization. The Chancellor cautioned the delegates that this was a very serious consideration and that thought must be given to the role of the Vice-President in years to come.

A. Chi withdrew his motion to close the nominations. A. Alpha withdrew her second.

A. Alpha moved to limit the number of names to be considered in nomination to four out of several names to be discussed. A. Rho and Psi seconded. Vote in favor was unanimous.

The following names were then suggested for discussion: Carl Hoffman (Univ. Ark.), Ralph Buchsbaum (Univ. Pittsburgh), P. H. Senn (Univ. Florida), Samuel Meyer (Florida State Univ.), Fred Hulse (Univ. Washington), Robert Pennak (Univ. Colorado), Hershel Roman (Univ. Washington), Howard Phillips (Emory Univ.).

It just happened that at this time Claude Adams (President of Sigma) brought Dr. Samuel H. Meyer to the meeting who wished to introduce the president of the Biology Club at Florida State University (which is a prospective new chapter of Phi Sigma for this year). Dr. Meyer made a few remarks and then left.

The discussion of names to be considered for nomination to the office of Vice-President was then resumed. For various reasons it was decided by the delegates to add the name of Samuel H. Meyer to the other two that had already been nominated—Dean Castetter and Mrs. Clare.

A written ballot was taken with Beta and Omega as tellers. Dr. Meyer won the great majority of ballots and Beta moved to make it unanimous. The motion carried.

Report of the Resolutions Committee was called for by the Chancellor, and was presented by the chairman.

1. "Whereas Dr. Harley J. van Cleave, Honorary President, died on January 2, 1953, be it therefore resolved that Phi Sigma at its General Meeting extend to his family its deepest sympathy."

2. "Whereas Sigma Chapter put forth extensive effort in our behalf, be it resolved that Phi Sigma extend to Sigma Chapter and through it to the University of Florida our sincere appreciation for aid in the arrangements for the 1954 General Meeting."

3. "Whereas the A.I.B.S. put forth helpful effort in our behalf, be it resolved that Phi Sigma extend to the A.I.B.S. and particularly to Dr. Hiden T. Cox, Deputy Executive Director and Convention Director, our sincere appreciation for aid in the arrangements for the 1954 General Meeting."

4. "Whereas Drs. Brodkorb, Hubbell, and Laessle presented open forum addresses, be it resolved that Phi Sigma extend to them its gratitude for these presentations."

5. "Whereas Dr. Laessle has recently suffered the loss of his father, be it resolved that Phi Sigma extend its deepest sympathy to him."

6. "Whereas Dr. A. I. Ortenburger, Retiring Chancellor, was unable to attend the 1954 General Meeting for reasons of health, be it resolved that Phi Sigma extend its best wishes to

him."

7. "Whereas this is the first biennial convention of Dr. Laurence H. Snyder, Honorary President, and he so successfully made the principal address at the banquet of this meeting, be it resolved that our deep appreciation be made known to him."

8. "Whereas the Treasurer, Mrs. Tema S. Clare, retires as a member of The Council, be it resolved that Phi Sigma extend to her its sincere appreciation for her services."

9. "Whereas the Vice-Chancellor, Erwine H. Stewart, retires as a member of The Council, be it resolved that Phi Sigma extend to him its sincere appreciation for his long and faithful services."

Beta moved that the report be accepted. A. Epsilon seconded. Vote to accept the report was unanimous.

The A. Rho delegate introduced Dr. Delbert Swartz. Dr. Swartz spoke as a member of Theta and Beta as well as a charter member of A. Rho.

Unfinished business was called for by the Chancellor. A return to discussion of some points in regard to constitutional changes.

A. Nu moved that, for the purpose as a point of discussion, a minimum of four business meetings be held per year. A. Pi seconded. Beta raised the point as to just what is a "business meeting". Question was called for and the motion was carried.

A. Epsilon moved that the word "goal" be inserted in this amendment because some chapters find it difficult or undesirable to have even a minimum of four business meetings per year. A. Alpha seconded, and the motion was passed.

A. Rho moved that the Exec. Secretary and Council be delegated to go over the constitution and work in the changes approved by the convention. A. Xi seconded and the vote was unanimous in favor.

New Business was called for by the Chancellor.

The subject of A.I.B.S. affiliation was raised. The Exec. Secretary summarized the feelings of The Council as follows: Affiliation would be mutually beneficial and that we should keep an open mind over the obvious desirability; The Council feels some concern, however, over the difficulty of meeting the financial obligation involved out of present operating expenses.

A. Rho moved that The Council should continue investigating the possibility for action at a future time. Psi seconded. Pi asserted that his chapter is unanimous in favor of affiliation now. Mr. Stewart remarked that affiliation with A.A.A.S. is also desirable and that we had received many favors from them in the past. He also could see that A.I.B.S. affiliation could be advantageous too.

The vote on the motion to table the motion and continue investigation was carried with one dissenting vote (Pi).

Phi Sigma Award was discussed at length regarding different practices in the various chapters for making the selections. The general idea seemed to prevail that it was not desirable to depart too widely from the original intent of the award, i.e., recognition for accomplishment in the regular undergraduate and/or graduate school work rather than a contest for willing participants in a specific writing of a paper, etc.

Dr. Swartz explained the operation of the award at A. Rho.

Claude Adams explained the operation at Univ. of Florida.

A. Chi expressed the belief that it might be a good idea to change the award back to a medallion. Several delegates thought it best to leave it as a certificate, and still others thought it a good idea to give both.

Exec. Secretary was instructed to investigate the medallion possibility and report at the next meeting.

Omega suggested that The Council consider the possibility of having the Phi Sigma General Meeting either before or after the A.I.B.S. meetings so the delegates can go to the scientific sessions. There seemed to be rather general agreement on this point and it will undoubtedly be seriously considered.

Claude Adams (President of Sigma, the host chapter) expressed pleasure on the part of himself, Sigma officers and the membership in being able to act as hosts. He hoped that everyone had enjoyed the meetings and considered them a success. The response was definitely in the affirmative.

The business sessions of the 1954 General Meeting were adjourned.

Wednesday morning and afternoon, Sept. 8th.

All day field trip, exceptionally well planned and full of surprizing and interesting things that one rarely if ever has any opportunity to see.

Black Swan Sanctuary, a breeding farm for the exotic waterfowl of the world. Among the many fowl seen were the Black-bellied Tree Duck of South America, the Shell Drake from the British Isles, the Black Swan, the Crested Crane from South America, and the Mandarin Duck from Manchuria. This Sanctuary is one of the few privately operated breeding farms for exotic waterfowl.

Birds of Prey, Inc., the second stop, is a 100 acre tract of land near Ocala where Dr. John Hamlet plans to put wildlife that have been used by man for hunting. Other than birds of prey common to our country are the King Vulture, the Harpie Eagle, the Caracara from South America, the Lappet-faced Vulture of Mt. Kilimanjaro from Africa, the White-fronted Sea Eagle from the Philippines, the Cormorant and the Anhinga from the Orient. Dr. Hamlet also has a pair of hunting Cheatas—the fleetest animals in the world; he demonstrated how they have been trained for racing. The exhibit has not been opened to the public and the visit of Phi Sigma delegates was for Dr. Hamlet a sort of "trial run" on the reaction of his birds and animals to other people. The delegates were honored, indeed, and certainly privileged to be given this rare opportunity.

Ross Allen's Reptile Institute, a part of Silver Springs, Inc., was visited to see the collection of reptiles and amphibians. A very interesting feature was an observation of the method of venom production.

Boat Trip at Silver Springs, while part of the tourist attraction to north central Florida, was well worth the delegates' time from a scientific standpoint. Rarely, if ever, does one see so many hundreds of fish in crystal clear water in interesting habitats. Our guide in the glass bottom boat was William Thompson, a colored gentleman, who turned out to be one of the high lights of the trip. He had almost as uproarious a time as the delegates.

The whole day was packed full of fun as well as scientific interest. It is doubtful whether the delegates could forget that wonderful day if they tried.

Evening, Sept. 8th.

Phi Sigma participated in the A.I.B.S. Biologists' Smoker and Open House. The delegates and some members of The Council got together for one last gab fest.

Acknowledgements

Dr. P. H. Senn was on hand as one of the genial hosts; in fact, he acted in this capacity all during the meetings. He functioned as the Phi Sigma representative on the local A.I.B.S. Committee and always seemed to be on hand with a contagious smile when he was particularly needed.

All of us are deep in our appreciation to Sigma for a most successful convention, and most particularly to Claude Adams (Sigma President) who by careful planing and genuine hard work for weeks did more than anyone in the whole of Phi Sigma to make this convention a very real success. *Phi Sigma salutes you, Claude Adams!* May a terrifically hard job terrifically well done be a satisfaction as you look back upon it.

The Florida Field Trip

by Claude T. Adams, Jr.

Following the meetings, the entire group took the last day for the long awaited field trip. Locations included in the trip were the Black Swan Sanctuary, John Hamlet's Birds of Prey, Inc., and two stops at the much publicized Silver Springs, namely, Ross Allen's Reptile Institute, and the Silver Springs boat trip.

The *Black Swan Sanctuary*, owned and operated by Mr. M. N. Gist of McIntosh, Florida, is a breeding farm for the exotic waterfowl of the world. Here he has brought together, more as a hobby than as a business, representatives of a great number of the waterfowl and upland game birds of the world. Among others, there were exhibited the Black-bellied Tree Duck of South America, the Black Swan and the Crested Crane from South Africa, the Shell Drake from the British Isles, and the Mandarin Duck from Manchuria.

Mr. Gist was a most congenial host and has always been quite cooperative with professional ornithologists. He would welcome correspondence from anyone interested in his hobby.

Birds of Prey, Inc., our second stop, was recently organized by Dr. John N. Hamlet, late of the U. S. Fish and Wildlife Service. The new home of the organization will be a 100 acre tract of land near Ocala, Florida, where John plans to put before the public all forms of wildlife that have ever been used by man for hunting. John, one of the three falconry experts in the United States, will display the art before the public in a manner never before attempted. Other than those birds of prey common to our country, John and his workers have captured personally, or bought, such foreign forms as the King Vulture, the Harpie Eagle, and the Caracara from South America; the Lappet-faced Vulture of Mt. Kilimanjaro from Africa; the White-fronted Sea Eagle from the Philippines; the Cormorant and the Anhinga from the Orient. Birds are not the only animals which are on exhibit here. John also has a pair of Hunting Cheatas which he has trained himself. According to John, he started their training by reading aloud to them. The female of the pair has become so docile that she takes the place of a cat in the Hamlet household. The male, however, is being maintained in the semi-wild state for exhibition purposes. What Phi Sigma delegates did not know was that this visit to *Birds of Prey, Inc.*, was a sneak-prevue of things to come. This exhibit had not been before the public prior to our visit to the Hamlet residence. To Dr. John Hamlet, Phi Sigma owes an undying debt of gratitude for such a wonderful show.

Our third visit was something of a deviation from the train of events. We stepped down the 'phylogenetic scale' to visit *Ross Allen's Reptile Institute*, one of the component parts of Silver Springs, Inc., and view his collection of reptiles and amphibians. While the Institute has specialized in placing before the public a collection of reptiles and amphibians of Florida, its background is more deep-seated. It was commissioned early in its development to supply venom to the major drug supply houses and to the Armed Services of the United States. In addition to its display of Florida fauna, there is an impressive array of such tropical forms as the Anaconda, the Boa Constrictor, the Python, and the Crocodile. For the benefit of those interested, there is a Seminole Indian Village within the confines of the Institute. To the Allens, Ross and Oliver, and to their staff, go our sincere thanks for an interesting and educational tour of the *Ross Allen Reptile Institute*.

For the benefit of our amiable Chancellor, Karl Lagler, we took still another step down the 'phylogenetic scale' and showed him the fresh water fishes of Florida, in their natural habitat. Our guide for the trip down Silver Springs Run was William Thompson. He is a veteran guide for Silver Springs, Inc., and as interesting as anyone would expect to find.

If anyone has the opportunity, get Karl to tell you about the "Catfish Hotel", or the "Football Game", or about any one of the 17 springs that we visited during the trip. I don't think Karl realized that we had such things in Florida.

In closing, I would like to add that Sigma thoroughly enjoyed acting as host for such a congenial group. We sincerely hope the National Council will see fit to select our campus for its meeting again soon.

CHAPTER EDITORS REPORT:

(This section is devoted to interchapter communication. Editors should submit only typewritten copy, double spaced. Chapter activities, speakers, alumni news, faculty appointments, and scientific books or articles emanating from chapter and faculty members should be included. The Secretary-Treasurer will send lists of initiates direct to the Editor-in-Chief who will insert them as they arrive.)

BETA

To be initiated 2 December:

Robert Day Allen (Faculty), Morton Covell Bartlett, Paul Frederick Basch, Michael Fraser Brewer, Eugene Maurice Britt, John Bayard Burch, William Francis Cheshire, Harriet Elizabeth Clark, Murray John Copeland, Julia Dean, Herbert Reutschler Drury, Loretta C. Ellias, Charles John Gebler, David Christopher Lee Gosling, Jack Varley Gwynn, James Walker Hardin, Jean Mildred Hathaway, Kirby Lee Hays, Evan Brandao Hazard, Robert M. Johns, Joseph Hiram Kite, Jr., Kathryn Mary Kneiske.

Joseph Soloman Krakow, Russell Earl MacDonald, Edith Marie MacLennan, Richard Edward MacMillen, William Halsey Menning, Sharon Raymond Miller, Evamar Allen Myers, Peter Fredrick Olsen, Lois Jean Paradise, Albin Richard Santala, Mary Elizabeth Seaman, Charles Steinmetz, Jr., Margaret Urkio Takagi, Dee Calderwood Taylor, Robbin Walker Thorp, Francesco B. Trama, Frank Whitehouse, Jr. (Faculty), Pauline Jane Wood, John Lewis Young, Richard Laurence Zusi, Bettie Robinson.

ETA

In accordance with the usual desire to have a new record of desired numbers of copies of the Biologist sent to your office, I am asking that 20 copies be sent of any issues published during the school year of 1954-55. We are not so tardy in doing this as we were last year.

This year we have an enlarged group, making for much better conditions than in many previous years.

Our four members of the spring semester of 1954, have left, two being graduate assistants at large universities. Of the ten initiated last June 14, only one was a senior finishing in the summer, nine are now in school, though one is in the College of Education and doing part time teaching and not available during the day; seven are full time seniors and one full time junior. Officers are President, Edward Morris; Vice-president, Richard Ellis; Secretary, Kenneth Holloman; Treasurer, Raymond Damian.

I am adding this data, though I suppose it is not necessary for you now. Dr. Orcutt of course has these records. I just sent him the new list of active officers recently.

Hereafter, any necessary communications will be taken care of by the new secretary, who will also use this address, Biology Department.

It will be well, however, to have packages of Biologists addressed to me as we seem to have some trouble with correct distribution on campus of mail, packages especially, not addressed to permanent staff members.

Walter C. Kraatz
Head, Biology Department

KAPPA

—University of Kansas
Lawrence, Kansas

President: Wendell Showalter, Dept. of Botany
Vice Pres.: Leland E. Keller, Dept. of Anatomy
Treas.: Dick Frederickson, Dept. of Zoology
Rec. Sec.: Maria Danguilan, Dept. of Bacteriology
Corr. Sec.: Ellis Hayden, Dept. of Entomology
Editor: Jacqueline Sinks, Dept. of Anatomy
Council Rep.: Mrs. Ruth E. McNair, Dept. of Biology

The above officers, for the year 1954-1955 were elected by the chapter in March. On March 31 at the annual banquet these officers were installed, and the following new members were initiated: Bacteriology — John E. Findley, Stanley A. Robrish; Entomology — Diana Amoss, Earle A. Cross, Wilford J. Hanson, Carl W. Rettenmeyer; Pharmacy — William S. Brinigar, Jr., John A. Durden, Jr., Gilbert H. Emick, Jr., Gilbert Y. Koff, Robert I. Leib, Phillip Rosenberg, Homer C. Scarborough, James H. Short; Zoology—Walter C. Biggs, Eleanor Dodge, Laurence D. Fairbanks, Charles M. Fugler, Jr., John M. Legler, Robert L. Packard, Harold D. Swanson, Alvin L. Wiens. The banquet speaker was Dr. Michael L. Furcolow, Associate Clinical Professor of Medicine, University of Kansas Medical Center, who spoke on "Medicine and the Social Importance of Histoplasmosis."

In addition to the banquet program the Kappa chapter heard the following series of talks given during the course of the year by members of the University of Kansas staff: Professor of Zoology, E. Raymond Hall, "Zoological Expeditions from the Arctic to the Tropics"; Professor of Anatomy, William C. Young, "An Endocrinologist Looks at the Kinsey, Pomeroy, Martin, and Gebhard Report"; Assistant Clinical Professor of Psychiatry, Sigmund Gundle, "A Psychiatrist Looks at the Kinsey Report"; Assistant Professor of Bacteriology, Theodore G. Metcalf, "Studies on Amino Acid Utilization by Richettsiae"; Professor of Geology, R. C. Moore, "Protoctista"; Associate Professor of Botany, Rufus Thompson, "Evolution in the Algae"; Research Assistant in Bacteriology, Paul Little, "Tissue Culture Studies".

At the last spring meeting Ellis Hayden was elected to serve as Kappa representative to the National Phi Sigma convention.

RHO

—University of Illinois
Urbana, Illinois

President: Walter W. Heck, Dept. of Botany
Vice Pres.: Dewayne L. Richardson, Dept. of Botany
Sec.: Barbara J. Howell, Dept. of Physiology
Treasurer: Sabath F. Marotta, Dept. of Physiology
Editor: Merle Mizell, Dept. of Zoology

This year's research awardee is Mr. Robert W. Lichtwardt, a graduate student in the Department of Botany. His research paper is entitled "Three Species of *Eccrinales* Inhabiting the Hindgut of Millipeds, with Comments on the Eccrinids as a Group". Mr. Lichtwardt's research was conducted under Professor Leland Shanor of the Department of Botany. Presentation of the award will be made at our annual Spring banquet on May 18th by Dr. Norman D. Levine.

At the banquet we will also welcome the following 44 initiates:

Agronomy: Earl C. Spurrier; Animal Sciences: Bryan Baker, Malcolm D. Lane, David A. Vaughan; Bacteriology: Suzann M. Cohen, Nina R. Evans; Botany: Donald A. Larson, William E. Martin, Phyllis C. Stephenson; Dairy Science: Gilbert B. Manning, George D. Rolleri, Joseph C. Wilcox; Entomology: Victor J. Brookes, Manfred D. Engelmann, Ivan N. McDaniel, Robert C. Wallace, Robert T. Yamamoto; Horticulture: Joan H. Dalheim; Faculty: James L. Leach; Physiology: Norman L. Biggs, Lottie V. Blaton; Donald B. Doemling; John M. Kurkjian; Caressa Y. Lauer; James L. Matthews, Frances V. McCann, Norman Meltzer, Richard G. Quevy, Jean K. Sonder, Donald V. Stfibolt, Joanne G. Walker, Marion Zucker; Psychology: Dorothy J. Flint, Samuel Hutter, Paul H. Poschel; Zoology: Bert B. Babero, Maria L. Bernardini, Wayne H. Campbell; James W. Davis, Stephen R. Geiger, William Z. Lidicker, George T. Perry, Diane Sheaffer, John P. Slimmer.

Our honorary members include Professor Oswald Tippo, Head of the Department of Botany and Dean of the Graduate College, and Professor George L. Clark of the Department of Chemistry and Chemical Engineering. Dr. Clark will also be the main speaker at the banquet.

SIGMA

—University of Florida
Gainesville, Florida

President: Claude T. Adams, Sr., Department of Biology
Vice Pres.: Paul J. Osborne, Department of Biology
Treas.: Robert Haubrich, Department of Biology
Rec. Sec.: J. M. Good, College of Agriculture
Corr. Sec.: John Mullins, Department of Pharmacy

Procrastination seems to have overtaken me. I apologize for not having ordered the Biologist earlier. Please send 60 copies for Sigma chapter.

Please check your mailing list to ascertain if the University Libraries, of the University of Florida is listed thereon. If they are not, please mail two copies to the Order Department, University Library, University of Florida, Gainesville, Fla. Let me know what steps are necessary to have them included on the permanent mailing list.

Our first meeting of the semester is listed for Wednesday night. We are hoping for an attendance of over 200, as this meeting is open to the public. The topic of our discussion is *"Writing 'That' Thesis or Dissertation,* by Dr. R. B. Vowles. Should be good. We'll let you know how it turns out.

ALPHA EPSILON

—University of Pittsburgh
Pittsburgh 13, Pa.

President: Grant Doering
Vice Pres.: Brother Robert Schuellein
Corr. Sec.: Doris Deliman
Rec. Sec.: Walter Donnellan
Treas.: Norbert Pietrzak
Editor: Dr. Clem Russ

The September meeting of the Phi Sigma Society was held on September 29 in the Conference Room of Mellon Institute. The newly elected officers assumed their duties.

Dr. Davenport Hooker, chairman of the Department of Anatomy at the University of Pittsburgh Medical School spoke on *"Some Observations on Human Embryos."* The talk was supplemented with slides and a film which was produced by Dr. Hooker after 20 years of careful experimentation and observation. Stimulus and response activities of human embryos were clearly shown in the film.

Dr. William Harrison Emig, a

Charter Member of Alpha Epsilon Chapter, retired last June at the age of sixty-six.

ALPHA OMICRON

—Marquette University
1217 W. Wisconsin Avenue
Milwaukee 3, Wisconsin

President: Robert Kinney
Vice Pres.: John Mittelstaedt
Rec. Sec.: Jacqueline Garner
Treas.: Richard Vogl
Corr. Sec.: Helen Wood
Editor: Gene McArdle
Faculty Counselor: Dr. James Barrett

The following items were contributed by Martin S. Cipar on 12 August:

"The Survival of Young Plant Seedlings after Dessication" was the subject of a talk given by Sister Mary William, O.F.M., at the February 16 meeting of Alpha Omicron chapter.

The annual Phi Sigma lecture was held on Sunday, March 14 at which time the chapter was addressed by Dr. Raymond E. Zirkle, Professor of Radiobiology at the University of Chicago, and consultant to the Division of Biological and Medical Research, Argonne National Laboratory. Dr. Zirkle's address was entitled, "Effects of Irradiating Small Parts of Dividing Cells".

The development of an apparatus for irradiating small parts of dividing cells is considered by many to be Dr. Zirkle's major contribution to Radiobiology. Using this apparatus an area as small at 2.5 micra could be irradiated and the effect on the dividing cell could be followed through to the next mitosis.

The first phase of this work involvbed irradiation of a large area of a nucleus in prophase. Following irradiation anaphase separation was not normal and resulted in chromosome bridges or polyploid nuclei.

Another phase of his work involved X-irradiation of small portions of certain chromosomes which lag behind at the centriole before moving onto the metaphase plate. If the centromere were irradiated at prophase, the chromosome would not move onto the metaphase plate and was then distributed randomly by cytoplasmic currents. It was then either lost or included in either daughter nucleus.

If a non-centromere region were X-irradiated, the chromosome moved onto the metaphase plate normally but at anaphase bridges were formed. This often delayed anaphase separation or sometimes resulted in a "hinge" effect. No effect on the movement of chromosomes to the metaphase plate or in anaphase separation was observed if the cytoplasm alone were irradiated.

Substitution of Ultra Violet light gave essentially the same results as obtained from using X-rays except that after Ultra Violet irradiation the chromatin appeared diffused in the irradiated region.

Dr. Zirkle superbly illustrated his talk with excellent moving pictures of the work described above.

On Tuesday evening, the 27th of April, the annual Phi Sigma banquet was held in Pabst Blue Ribbon Hall. Initiations were held prior to the buffet dinner. New members admitted to Alpha Omicron chapter are as follows: John Bamrick, Charlotte Cyzak, Robert Fabiny, Francis Gallagher, Jacqueline Garner, Stavri Joseph, Kenneth Lynch, Eugene McArdle, Robert McFarland, Irene Minick, John Mittelstaedt, William Pingpank, Louis Wilson, and Mary Moran.

The schedule of events was closed on Sunday, the 16th of May at which time our annual picnic was held at Greenfield Park. A good time was had by all hands.

Before closing this report, I wish to say that I am happy to have served the Society in this small way. My sincerest regards to you, Father Keefe, and my best wishes for a bigger and better Biologist.

On October 7 the new Editor, Gene McArdle contributed the following:

This introduction will be as bolt from the blue . . . but may I introduce myself as the new, fledgling "chapter editor" from Marquette's Alpha Omicron. Marty Cipar has passed the books to me and I shall attempt to supply The Biologist with whatever materials may be desired by you.

Our first monthly meeting is scheduled for October 19, but plans are already afoot to reorganize a Chapter Newsletter, which would serve as the official organ for Alpha Omicron, and allow us, as well, to keep in better touch with departed chapter members. It is projected that it would contain such matters as the Calendar of Events for the year; the listing of the revised duties of certain members as a result of the Florida Convention; a report from our delegate to that Convention; and perhaps a "Through the years . . . " section giving bits of info concerning our friends in other universities and colleges. As of now it's all on the planning board, but we hope to have some action soon.

I'm not sure if the following bits are what you would like to have by way of news, but nevertheless, enclosed is a clipping that appeared in the Marquette Tribune recently, stating the receipt of a grant by two of our fellow members of Shi Sigma . . . Father John P. O'Brien, Ph.D., and Edward Frank.

Our Corresponding Secretary, Helen Wood, who was also our delegate to the Convention, tells me that you would like to have the approximate number of Biologists that we would need. Counting several complimentary copies to members of the University we could easily distribute 65 copies. Its reception here on campus has been remarkable, and most of us read it from cover to cover.

Best of luck with the first issue. If I have been vague, or misleading, or even not-helpful-at-all, please let me know, and I'll mend my ways.

Following additional items have been clipped from Vol. 1, No. 1, of Alpha Omicron's new *Phi Sigma Newsletter*:

This is the beginning of what we hope will become a quarterly Newsletter of the activities and events associated with our chapter of Phi Sigma. It was suggested at a recent meeting that there should be a material nexus between members of the chapter, which would then enable members to keep in contact with each other, and we trust that this attempt will supply the link needed. It will however be only as useful as it is *used* by the membership. We intend that it will be the official organ of the Editorial Board, but it should, more importantly, be the springboard for news of its individual members. Now, what constitutes "news"? We're interested in everything about everyone who is a member of Phi Sigma. Personal items such as engagements and announcements of forthcoming marriages. The birth or christening of children. Place of residence. Scholastic information such as what you are doing currently. In what areas of research you are involved. Your current place of employment. Promotions. Attendance at local or national meetings of learned societies. Publication of experimental materials in journals . . . and many more items . . . in fact *everything*, for it will be of interest to us in the Chapter. What say? Are you with us? Material for the Newsletter may be addressed to the Editor, c/o Dept. of Biology, Marquette University. We are counting on *you!*

At the last regular meeting of the 1953-54 year, Miss Helen Wood was elected to be our chapter delegate to the biannual Phi Sigma Convention. The following is a report (in part) of her statement to the membership at the October 19, meeting: "The Phi Sigma Biannual Convention was held on September 5 through 9 at Gainesville, Florida, in conjunction with the meeting of the American Institute of Biological Sciences." "As a delegate," said Miss Wood, "I can report that the national officers and chapter delegates were 'royally' received by Sigma Chapter, which acted as host to the Convention. At the regular business sessions, Dr. Sam Meyer of Florida State University was elected to the vacated office of vice-president, and reports were submitted by all National officers. Policies of Phi Sigma were restated and suggestions were given to the chapters for coordinating activities and renewing interest among chapter members. Several constitutional amendments were incorporated into a revised constitution to be published in the near future. A highlight of the convention was an all-day field trip to the famous 'Silver Springs', Florida." (A blow by blow account of the Convention proceedings will be published in a forthcoming issue of the *Biologist.*)

News . . . and . . . Views

Members will be interested to know that Dr. John W. Saunders (in association with John M. Cairns) is represented in the November issue of the *Journal of Experimental Zoology* (Vol. 127), with an article entitled: "The influence of embryonic mesoderm on the regional specification of epidermal derivatives in the chick."

Father Raymond Reis, S.J., Director of the Department of Biology at Marquette is currently convalescing at St. Joseph's Hospital, after a brief illness. All the Chapter extends its wishes in a hearty, "get well soon!"

In Re: Change of Addresses

This is to remind past members to keep us informed of their movements so that we may continue to keep in touch with them via the Newsletter. If you are planning a change of address or are aware of some Phi Sigmer who is, please send a postcard to that effect to the Corresponding Secretary: Helen Wood, c/o Dept. of Biology, Marquette University.

Dr. Fimian, Speaker at Oct. Meeting

A new member of the Marquette faculty, Dr. Walter Fimian, spoke at the October meeting of the Alpha Omicron Chapter. His subject was: "Factors Affecting the Growth of Amphibian Tissue in vitro." Dr. Fimian recently received his degree from Notre Dame University.

What Phi Sigma "Graduates" Are Doing . . .

Here are some of the present occupations of a few of last year's members of the Chapter:

Pete Amenta is working for his doctorate at the University of Chicago in Radiation Biology under last year's Phi Sigma speaker: Dr. Zirkle.

Lou Pierro studying for his doctorate in Embryology at Brown University.

Frank Gallagher is also at Chicago, heading towards the Ph.D. in Physiology.

Robert McFarland was accepted to the fall class at Temple Medical School.

October 19 — *Tuesday*

Place-time: Science Building, 307, 7:45 p.m.

Subject: "Factors Affecting the Growth of Amphibian Tissue in Vitro"

Speaker: Dr. Walter Fimian, Biology Dept., Marquette University

Report: On 1954 National Convention, Miss Helen Wood.

Election of Candidates for membership.

November 16 — *Tuesday*

Place-time: S-307, 7:45 p.m.

Speaker: Dr. Ewart G. Bertram, Dept. of Anatomy, Marquette Univ.

Subject: "The Morphology of Cells According to Sex."

December 14 — *Tuesday*

Annual Christmas Party — place to be announced: Mitchell Park, 7:45 p.m.

Speaker: Mr. Merle Deusing, Milwaukee Public Library

Subject: "The Everglades", movie

Initiation of new members.

January 11 — *Tuesday*

Place-time: S-307, 7:45 p.m.

Speaker: Dr. Joseph C. Baier, Dept. of Zoology, Univ. of Wisconsin Ex.

Subject: "Precipitins and Phylogeny"

February 15 — *Tuesday*

Place-time: S-307, 7:45 p.m.

Speaker: Mr. Eugene D. Kitzke, Johnson Wax Co., Racine, Wisconsin.

Subject: "Some Aspects of Waxy Palms, Including the Carnauba of Northeastern Brazil."

Election of Candidates for membership.

March 27 — *Sunday*

Annual Invitational Speaker (to be announced)

April 19 — *Tuesday*

Place-time: To be announced.

Annual Banquet

Initiation of Candidates

May 6 — *Friday*

Place: Science Building

Time: All day

Annual Presentation of Demonstrations on Research

Election of New Officers

May 15 — *Sunday*

Place: To be announced

Time: All afternoon

Annual Picnic

To be initiated in Alpha Omicron Chapter, December 14, 1954:

Ariel Bar-Sela, Alan Bernard Becker, Lee Henry Gimler, Ernest J. Harris, Wilfred Koon Leong Man, Marianne Virginia Schaaf (Faculty), Patricia Barbara Wroblewski.

ALPHA PSI

—Virginia Polytechnic Institute
Blacksburg, Virginia

President: Paul H. Smith

Alpha Psi initiated the following on 1 December 1954:

William Bramlett Allison, Jr., Gordon Derwood Bowman, II, Danford Erid Cantner, Lila Waller Easley, Maynard George Hale (Faculty), Charles Littleton Hanson, Willoughby Shelton Hundley, Jr., James Wallace Gill, James Pitzer Gills, Jr., John Benford Lindamood, Lawrence Russell Moter, William Ernest Norcross, Marvin Prince Proctor.

ALPHA OMEGA

—University of Georgia
Athens, Georgia

President: Mary Dunn
Vice Pres.: Robert Gibson
Rec. Sec.: Helen Jordan
Corr. Sec.: Ross Bowersett
Treasurer: Frederick Everhart
Editor: Philip Coleman

As Alpha Omega climaxes its third year as an active chapter of Phi Sigma Society, we would like to report that everything is going wonderfully well in our part of the deep south. During the past quarter the chapter has had many enlightening and entertaining meetings and activities, which were enjoyed thoroughly by its members.

At the last meeting of the Winter quarter held on March 10, 1954, the new officers for the forthcoming year were elected.

Also during the last meeting of the Winter quarter, twelve new members were elected to the Society; and on March 24, 1954, the first meeting of the Spring quarter, they were initiated into the Society. Their names are as follows: Peter Miller Burkholder, Mary Ann Church, Catherine R. Fischer, Betty Lou Jones, Helen Ann Kyser, Marion Chandler, Ellyn Duggar, Jack E. Catlin, Rudolph Franklin, Daniel Nelson, and Byron C. Smith.

On April 7, 1954, the Alpha Omega chapter held its annual banquet. After the chapter members had enjoyed a delicious meal, Dr. H. O. Lund presented a Phi Sigma Award for the outstanding junior student to Theordore Yerasimides, a student at the University of Georgia's Veterinary School.

After the presentation of the award the new officers were installed by the outgoing president, Richard Bradley; and the installation ceremonies were followed by the introduction of Dr. Daniel Billen, the speaker for the evening. Dr. Billen, Oak Ridge National Laboratory, addressed the chapter on "The Effects on Cellular Organization and Chemical Constitution".

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BIOLOGICAL HONOR SOCIETY

"The object of Phi Sigma is to promote interest in biological research. Although always designated as an honorary biological research society, it should be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

MILE POSTS

1915	March 17, Alpha Chapter organized, Ohio State University, Columbus.
1916	May, Central Governing Body organized, BIOLOGIST first issued.
1917	June, last War-time BIOLOGIST issued.
1921	February, BIOLOGIST revived.
1924	December, First National Meeting, Constitution revised, Washington, D. C.
1925	December, Second National Meeting, First Science Program, Kansas City.
1926	December, Third National Meeting, Second Science Program, Philadelphia.
1927	December, Third Science Program, Nashville.
1928	December, Fourth National Meeting, Coat-ofArms adopted, Fourth Science Program, New York.
1930	January, Council Meeting, Ritual Revised, Norman, Okla.
	December, Fifth National Meeting, Fifth Science Program, Cleveland.
1931	Phi Sigma Letters Registered, U. S. Patent Office.
1932	December, Sixth Science Program, Atlantic City.
1933	June, Sixth National Meeting, Seventh Science Program, Chicago.
1935	December, Seventh National Meeting, Eighth Science Program, St. Louis.
1937	December, Eighth National Meeting, Ninth Science Program, Indianapolis.
1939	December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.
1941	December, Tenth National Meeting, Dallas, Texas.
1946	December, Eleventh National Meeting, Boston, Mass.
1948	December, Twelfth Meeting, Eleventh Science Program, Albuquerqe, N. Mex.
1949	February, Joins the ASSOCIATION OF COLLEGE HONOR SOCIETIES.
1950	December, Thirteenth Meeting, Denver and Boulder, Colorado.
1952	December, Fourteenth Meeting, St. Louis, Mo.
1954	September, Fifteenth Meeting, Gainesville, Fla.

THE BIOLOGIST

EDITOR: Dr. Anselm M. Keefe, St. Norbert College, West DePere, Wisconsin

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COUNCIL

HONORARY PRESIDENT: Dr. Laurence H. Snyder, Dean of the Graduate School, University of Oklahoma, Norman, Oklahoma.

PRESIDENT: Dr. Karl F. Lagler, Department of Zoology, University of Michigan, Ann Arbor, Mich.

PAST PRESIDENT: Dr. Arthur I. Ortenburger, Department of Zoology, University of Oklahoma, Norman, Okla.

VICE-PRESIDENT: Dr. Samuel H. Meyer. Florida State University, Tallahassee, Florida.

SECRETARY-TREASURER: Dr. Fred S. Orcutt, P. O. Box 454, Blacksburg, Virginia.

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Of All Active Chapters

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EPSILON—University of Denver, Denver, Colorado, founded 5 March 1917.

ZETA—University of Wisconsin, Madison, Wisconsin, founded 30 May 1917.

ETA—University of Akron, Akron, Ohio, founded 20 April 1921.

KAPPA—University of Kansas, Lawrence, Kansas, founded 31 May 1921.

LAMBDA—Montana State University, Missoula, Montana, founded 4 May 1921.

NU—Washington and Jefferson College, Washington, Pennsylvania, founded 11 May 1922.

PI—Emory University, Georgia, founded 3 January 1925.

RHO—University of Illinois, Urbana, Illinois, founded 28 March 1925.

SIGMA—University of Florida, Gainesville, Florida, founded 4 December 1925.

UPSILON—Miami University, Oxford, Ohio, founded 7 May 1926.

PHI—University of New Hampshire, Durham, New Hampshire, founded 21 May 1926.

CHI—Montana State College, Bozeman, Montana, founded 11 February 1927.

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ALPHA NU—University of New Mexico, Albuquerque, New Mexico, founded 21 April 1935.

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ALPHA OMICRON—Marquette University, Milwaukee, Wisconsin, founded 18 June 1938.

ALPHA PI—University of Colorado, Boulder, Colorado, founded 24 May 1941.

ALPHA RHO—University of Arkansas, Fayetteville, Arkansas, founded 23 May 1945.

ALPHA UPSILON—University of California at Los Angeles, California, founded 17 May 1947.

ALPHA PHI—College of Puget Sound, Tacoma, Washington, founded 28 February 1948.

ALPHA CHI—University of the Philippines, Manila, Luzon, P. I., founded 12 March 1949.

ALPHA PSI—Virginia Polytechnic Institute, Blacksburg, Va., founded 24 May 1949.

ALPHA OMEGA—University of Georgia, Athens, Georgia, founded 17 May 1951.